October 1971

WEEDS TREES and TURF

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WEEDS TREES and TURF

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The Cover

New for the industry is the Earth Saw, introduced by the Ditch Witch Division of Charles Machine Works, Perry, Okla. Shown here, it is actually sawing out a trench for irrigation lines through Florida coral. It has also sawed its way through 8-inch reinforced concrete and is especially recommended for working frozen ground. Equipped with special carbide teeth, the unit comes in two sizes, one cutting to depths of 24 inches, a larger one up to 30 inches. Both units open 4-inch wide trenches. Teeth revolve during trenching. See story, page 34.

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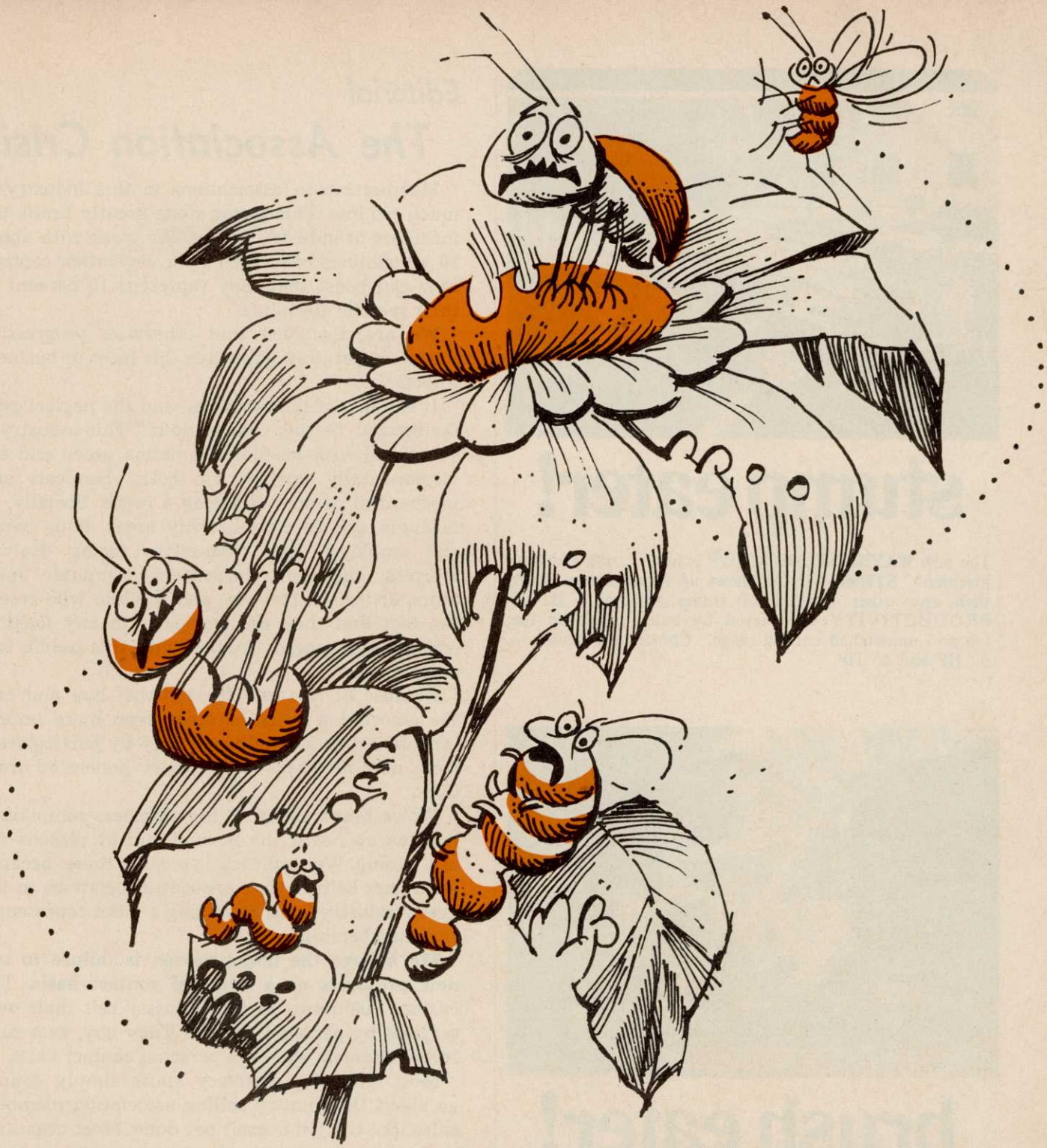

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Editorial

The Association Crisis

Membership in associations in this industry is much too low. This factor alone greatly limits the influence of industry groups. We work with about 20 associations concerned with vegetation control. Few can boast that they represent 10 percent of their specific discipline.

We are dismayed that otherwise progressive business operators will leave this facet of business undone.

It is a fact of the business—and the neglect goes far beyond "letting George do it." This industry—concerned with keeping the nation green and environmentally upright via both chemicals and mechanical means—is facing a crisis. Socially, in business, and in civic activity areas, both owner and employee find themselves facing doctors, lawyers, engineers, carpenters, computer operators, druggists, bankers, and the like who resent the fact that they use pesticides in any fashion, and for any reason. Contact with this public is a daily thing.

Because of this and the national hue and cry, the association voice becomes even more important. It can be strengthened only by participation from new members—and money generated from dues.

We've heard about all the members complaints. And we've heard the normal run of reasons for not joining. We won't try to answer these, because we do not believe they prevent associations in the green industry from attracting a more representative membership.

We believe the major reason is failure to sell new prospects on a personal contact basis. The custom businesses in our industry sell their own services by personal contact. They buy, as a rule, from salesmen, and on a personal contact basis.

Most executive-secretary staffs simply cannot go about the country selling association memberships. So, the job doesn't get done. Most organizations limp along with 10 percent or less of their potential.

Crux of solving the problem is selling. We believe that existing members—vitally interested in their association and their businesses—can do this selling job. They need help with promotion and sales materials. But they can recruit successfully.

The most successful associations we've known have offered such services as insurance, marketing programs, technical aids, legislature leadership, and many others. But such activities have been supported by aggressive membership which represented a big segment of their potential.

If we had any influence in this sector, we'd suggest your mailing your membership check today.

Here's a more attractive way to keep bare ground bare.

Use Princep® herbicide in the fall or early spring to kill weeds before they come up. That way you don't have a lot of ugly dead weeds hanging around as you do with contact weed killers.

Not that Princep eliminates the use of contacts entirely. You may need them to get the few weeds Princep misses. But starting with Princep as the foundation for your herbicide program, you can solve the bulk of your weed problems. More economically and safely than anything else.

Safely, because Princep has little contact action, won't volatilize, and strongly resists lateral leaching in the soil. It can be used around many ornamental plantings and nearby crops.

So if your object is bare ground weed control, use the safe herbicide. The economical herbicide. And the best foundation herbicide. Princep.

For information about Princep, and other Geigy herbicides, AAtrex®, Pramitol®, and Atratol®, write to Geigy Agricultural Chemicals, Division of CIBA-GEIGY Corporation, Ardsley, New York 10502.

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Government News / Business

New Look of Pesticide Bill Latest changes in the proposed Environmental Pesticide Control Act of 1971, now in the House Committee on Agriculture, call for two pesticide categories instead of the original three. General use pesticides would be those not considered dangerous to man or the environment and restricted pesticides would be materials highly toxic to man or the environment. New language in the latest copy of the proposed bill would confine use of restricted pesticides to trained applicators or under the immediate supervision of trained applicators. Heavy fines of up to $25,000 could be leveled at companies and their responsible officials who knowingly violate the law. Farmers could be fined up to $1,000 and receive 30-day-jail terms. A civil penalty provision could mean a fine of $5,000 against a firm and $1,000 against a farmer.

Freeze-Dried Grass Clippings Chemists of the Western Regional Research Service, USDA, Berkeley, Calif., have worked up a way to freeze-dry clippings from lawns, grind them into a meal and make high-quality, nutritive additions for poultry feeds.

New Head For EPA Health Group Dr. Vaun A. Newill, in charge of health-effects research for the Federal air pollution control program since 1968, has been named to manage the health-effects research program of the Environmental Protection Agency. The health-effects effort, with a staff of 350 persons and a budget of $9 million, is directed at identifying health effects of water and air pollution, solid wastes problems, pesticides, radiation, and noise.

Chemtrec--For Emergencies Members of the Manufacturing Chemists Association have launched a new program to deal with emergencies that might arise during shipment of potentially hazardous chemicals. CHEMTREC, as it is called, is a voluntary effort to provide information to organizations such as police, fire, and other officials who may be dealing with the emergencies. It is being coordinated with the 18-month-old National Agricultural Chemicals Association program called the Pesticide Safety Team Network involving Class B pesticides.

USDA Research Agreement A 2-1/2 year contract with the West Virginia Agricultural Experiment Station, Morgantown, to develop Appalachian plants for landscape use.

Label For Krovar I DuPont has received Federal registration by the Environmental Agency for "Krovar" I weed killer as a general industrial herbicide for non-crop areas. It is a wettable powder designed for highways, railroads, industrial plant sites, and similar non-crop locations. DuPont reports the chemical is formulated to work against a wider range of weeds than bromacil or diuron when used alone, and that it reduces the need for retreatment.

Try Tandex on your own impartial panel of weed control experts.

Tandex can give you a more economical ground maintenance program.

Tandex is a soil sterilant. And it's proven its weed-killing power for use around industrial plant sites, storage areas, lumberyards, tank farms and the like. Broadleaf weeds, grasses, even woody species die when Tandex is applied. And its power persists for a season or longer.

Spray wettable Tandex powder (WP 80) or use the granular form. The handy five-pound plastic container is especially convenient. Tandex can be combined with fortified oils and other herbicides for special control situations.

Write to Department A, Niagara Chemical Division, FMC Corporation, Middleport, N.Y. 14105.

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RIGHTS-OF-WAY THE NEW LOOK

By HAROLD F. POMEROY

RIGHTS-OF-WAY needed for electric lines to carry energy are under wide-spread discussion.

The public is greatly concerned with their locations, and also with appearance, the methods of clearing and disposing of the trees and brush, and, finally, the maintenance programs used to control the vegetation.

The utility is even more concerned than the public. In Northeast Utilities, every effort is being made to fully utilize existing rights-of-way in order to minimize the need for new rights-of-way. When new transmission lines are planned, one of the first steps is to study present and future land use to insure that a new right-of-way does not conflict with some other best use of the land. Efforts are also made to locate lines on the sides of hills rather than along the ridges, to cross highways at right angles, and to insert angles in the lines in order to keep visibility objections to a minimum.

Mr. Pomeroy is System Superintendent of Transmission and Distribution for the Northeast Utilities Company, Hartford, Conn.

The clearance of rights-of-way has received intense consideration. Our specifications require that those areas in prominent public view such as those adjacent to roads, parks or rivers be cleared selectively. All desirable species, with mature heights that will not interfere with the conductors, are saved. The better appearing trees that are tall enough or that would grow tall enough to cause the line to trip out are trimmed back. Where the trees are too tall to permit aesthetically pleasing trimming, they are removed. Gradually, over a period of years with proper planned removal of the tall, potentially interfering trees, the area is opened up and the desirable species such as dogwoods and shrubs take over and make a natural screen for the rights-of-way.

In the areas remote from general public view, all vegetation that would interfere with construction is removed. This cutting is confined primarily to the central portion of the right-of-way which is directly under the conductors. Within the right-of-way, an the sides of this cleared area, we endeavor to obtain a tapered apppearance by selectively removing only those trees which could cause line failure at maturity.

So called "Danger Trees" are removed along the sides of the right-of-way. These are the trees tall enough or in poor condition which could fall into the lines. As time passes and the trees grow, it is usually necessary to remove additional trees along the right-of-way sides to prevent line failure for the same reasons.

Desirable species, such as laurel, dogwoods and others shrubs are not cut in either the selective cutting areas or in the remote areas. The end result with our right-of-way clearing and future vegetation management programs will be not only the natural development of a scenic, good looking, compatible area but also the establishment of potential multiple use land with greater benefits to wildlife.

After cutting comes the big problem of disposal of the cuttings. Our specification offers alternative methods applicable to the different conditions and areas of cutting.

Sawlogs and other smaller logs are normally left neatly piled where they will not interfere with construction. Occasionally, where logs will not be utilized and burning is permitted, whole trees are piled and burned.

In the selective cutting area, logs are piled out of sight, and we dispose of all the brush that can be seen. This may be by physical removal to another portion of the right-of-way or by chipping. In the remote areas, our plan calls for disposal of brush up to 4 inches in diameter by one of the following methods or a combination of them: (a) chipping, (b) burning, or (c) leaving it piled for wildlife habitat and natural decay.

Both the states of Connecticut and Massachusetts in which we operate recognize the difficulty of the disposal problem associated with the clearing of wooded areas. Both states exercise rigorous controls over open burning and we are cooperating with their regulations.

The one time burning of brush as a means of disposal has some very desirable benefits without being a major contributor to the air pollution problem.

Recent research in California has disclosed the fact that the high visibility of open burning is the main reason for protest. Intensifying heat during open burning tends to reduce the particulates and hence the appearance of smoke. Dr. Ellis Darley's research found that the burning of brush contributes relatively

Northeast Utilities burns cleared brush using fanned air and kerosene to intensify burning with less air pollution.

In selective initial clearing, chipper is used to help handle brush.

Selective basal spray by back pack power sprayer is part of maintenance program.

A 115 KV right-of-way under good control as the result of selective basal sprays. Ornamental steel poles are in background.

Selective initial clearing for a 345 KV line through a public recreation area includes a narrow access road with small trees and shrubs saved.

small quantities of hydrocarbons to the atmosphere. Native brush yields about 6.7 pounds per ton burned, fruit prunings yield about 13.9 pounds per ton, and barley straw yields about 18.2 pounds per ton. In contrast, gasoline yields about 130.0 pounds per ton.

The fact that the conspicuous open burning of brush is by far less hazardous than the automobile caused pollution is of little consequence to the objectors of open burning because the smoke caused by brush fires can be easily seen.

The leaving of the brush along the right-of-way has the advantage of providing a habitat for small game, however, large piles of brush are unsightly and do provide some concern as a potential fire hazard.

The chipping of the brush has been limited primarily to the areas along the travelled ways where trailer mounted chippers can dispose of limbs up to about 4 inches in diameter. Larger chippers have been developed that can handle trees of a foot or more in diameter. These larger machines are not too adaptable to rights-of-way disposal.

Our program for control of the woody vegetation along the rights-of-way varies in accordance with needs and regulatory requirements. The use of chemical herbicides is strictly controlled and limited to selective applications. Herbicide treatment is part of the initial clearing and is done either prior to cutting, or by treating the cut stumps, or (if conditions do not permit either of these) after the first or second growing season when the sprouted unwanted vegetation is treated with a basal application during the dormant season, if practicable. Selective methods of control results in the minimum use of herbicides. Re-applications in later years are less frequent and the amount of herbicide used per application is less as the rights-of-way become filled in with desirable species that are not sprayed but left to grow and mature. These methods avoid objectionable brown out when used during the dormant seasons.

In public supply watershed areas of both Connecticut and Massachusetts, "Ammate X-NI" is presently approved by the states as the herbicide to use. This requires a waterborne application during the growing season which unfortunately does produce visual brown-out, and greatly reduces selectivity.

The concern with the use of herbicides has been magnified by the news media. Extensive research and long years of actual application of these chemicals, without any documented hazardous effects seemingly has not convinced the public that this is a safe and beneficial method of control. The increase in productivity of farm crop lands and range or pasture lands has been achieved largely through the use of those chemicals that eradicate the undesirable herbaceous and woody weeds. Unless a person is directly involved with land use, it is most difficult to appreciate the benefits the whole population has enjoyed through the use of these chemicals.

NU, seriously concerned with our vegetation control program, solicited the services of an independent consultant to thoroughly review our practices. This consultant, the "Center for the Environment and Man, Incorporated," has completed its study and made its report. It confirms that the methods of control used are safe and in accordance with the regulatory requirements. The consultant investigated our practices in the field and discussed them with leading herbicide authorities. The report is available for public review, and has been widely disseminated since its introduction last December.

The investor owned utilities through their organization, The Edison Electric Institute, has initiated a research project RP-103, "Environmental Effects of Herbicides."

The project is a continuation of several research efforts that have been conducted in the past. The research effort will be applied to soil ecology and the persistance of chemicals when applied in the rights-of-way. It will provide continuous monitoring of this important method of control.

It has been said that a problem recognized is a problem solved. Surely the problems of our environment are being fully recognized. Our needs for industrial expansion were recognized and it appears now that we put on blinders to overlook the side effects, thus creating many of the pollution problems we have today. Let us not again put on blinders and attack the pollution problems as an independent item. We must establish priorities for methodical solutions, and we must consider interrelationships in the total picture.

Communication is the basic requirement for effective preservation of a healthy environment. The most difficult job ahead will be keeping the public informed of the facts and influencing sound decisions based on those facts. This will not be an easy task, but it is in good, capable hands.

Light, lean and hungry

Never before has there been such a superb line of light, fast, tough and powerful line clearing and tree maintenance tools as these. Skillfully engineered, carefully built Limb-Lopper tools will give you years of dependable, low-maintenance service under tough operating conditions.

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Dealers nationwide. Write or call collect. Limb-Lopper Co., Inc., 11845 Burke Street, Santa Fe Springs, Ca. 90670. (213) 696-1128.

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TURFGRASS SEED AND FERTILIZER BIDDING SPECIFICATIONS

By WILLIAM E. KNOOP

EXTENSION TURF SPECIALIST, UNIVERSITY OF NEW HAMPSHIRE

SIZEABLE seed and fertilizer purchases often require the buyer to solicit bids.

Offering a proposed purchase of seed and fertilizer for competitive bids has several advantages. Because you are asking companies to compete for your business, they will quote the lowest price within a realistic profit margin. They must give you no more than stated in your bid specifications. If the specifications are not clearly presented, you will receive undesirable materials. Reasonable and correct specifications will assure quality materials at the best possible price.

SPECIFICATIONS FOR THE PURCHASE OF TURFGRASS SEED

Each state has laws to govern the production and sale of turfgrass seed. In general, each state requires the seed producer to list certain information on the seed container. It may be printed on the box or on a tag attached to the container. The information usually includes the following:

1. The name of the seed **producer** or **seller.**
2. The seed **lot number.**
3. The seed variety (sometimes including the scientific name)
4. The percent purity of each variety and species present (if a mixture).
5. The percent live seed of each variety as expressed by **germination.**
6. The percentage of any **weed** or **crop seed** present.
7. The percentage of any non-seed material present expressed as **inert matter.**
8. A list by variety of any noxious weeds present and their **rate of occurrence** (usually number of seeds per pound).
9. The **date** when last the seed was tested for germination.

Sample seed tag data are shown in Table 2. Your bidding specifications should include requirements for the same information. It is your prerogative to control the quality of your proposed purchase by specifying the **purity** and **germination** percentages on your bidding proposal.

These should be considered minimum quality standards for turfgrass seed. In addition to purity and germination standards, you should specify that **there cannot be any noxious weeds present** and that the seed must have been **tested for germination within the past 9 months.** Usually the area to be seeded will require a mixture of turfgrasses rather than a single variety. When asking for bids on a seed mixture, there are several problems. The first is whether to specify the mixture in percent by weight or percent by volume. Another problem is how to be sure the seed obtained is indeed the mixture ordered. The best answer to both problems is to bid each grass variety separately and mix them yourself. A sample bidding specification follows. Note that the sample specification calls for 260 lbs. of Kentucky Bluegrass, 100 lbs. of Creeping Red Fescue and 40 lbs. of annual ryegrass. That will combine to form a 65% Kentucky Bluegrass, 25% Creeping Red Fescue and 10% annual ryegrass mixture.

SEED NOT MEETING SPECIFICATIONS

At one time or another seed meeting your purity or germination standards may not be available. In that event an adjustment may be made in the amount of seed purchased so the bid is not rejected.

As an example, in the sample bidding specifications, we ask for 260 lbs. of Kentucky Bluegrass of at least 85% purity and 80% germination. Purity x germination equals the percentage of pure live seed present. 85% purity x 80% germination = 68% pure live seed. Assume that Kentucky Bluegrass seed of a purity of 85% was not available and that the purity of the available seed was only 80%. This means that 80% purity x 80% germination = 64% pure live seed as compared to the 68% requested in the specifications. Rather than cancel the bids because no supplier could meet the specifications, the supplier could be allowed to increase the amount of seed to make up for the lower purity. The following shows how such an adjustment would be computed. The equation is:

$$C = \frac{A \times D}{B}$$

A = % pure live seed requested (68%),

B = % pure live seed supplied (64%),

C = amount of lower purity seed to be supplied,

D = amount of seed requested (200 lbs.).

Using the sample figures in parentheses,

$$C = \frac{68 \times 260}{64} = 276 \text{ lbs.}$$

The supplier could furnish 272 lbs. of his Kentucky Bluegrass and you would still have the same number of pure live seeds requested in the bid specification.

A sample statement for possible inclusion in bidding proposals might be as follows:

> In the event that only seed lower in purity and germination than the above standards is available, the low bidder may furnish an increased amount of seed, at no additional cost, provided that he match on the basis of pure live seed the quality of the seed required in the bidding specifications. Seed 10% lower in either purity or germination will not be accepted.

SPECIFICATIONS FOR THE PURCHASE OF TURF FERTILIZER

Each state has a law governing the manufacture and sale of fertilizers. The manufacturer must place a statement guaranteeing the weight and analysis of the fertilizer

Table 1. Suggested Purity and Germination Percentages For the Common Turfgrass Varieties

Variety	Scientific Name	Purity	Germination
Kentucky bluegrass	*Poa pratensis*	85	80
Creeping red fescue	*Festuca rubra*	97	85
Tall fescue	*Festuca arundinacea*	98	85
Annual or Italian Ryegrass	*Lolium multiflorum*	97	85
Perennial Ryegrass	*Lolium perenne*	97	85
Colonial bentgrass	*Agrostis tenuis*	97	85
Creeping bentgrass	*Agrostis palustris*	98	85
Red Top	*Agrostis alba*	90	90

on, or attach it to, the bag or container. If the fertilizer is delivered in bulk, a written statement containing the same information must be supplied to the purchaser at the time of delivery.

The statement of analysis guarantee must contain the following information expressed as percent by weight:

1. The total amount of nitrogen (N) in the fertilizer.
2. The amount of water insoluble nitrogen (W.I.N.) present, if claimed (by the formulator).
3. The amount of phosphorus (P) present, expressed as P_2O_5.
4. The amount of potassium (K) present expressed as K_2O.

A sample label for a 12-2-8 fertilizer might read:

Jones Fertilizer Company

Total Nitrogen	12%
W.I.N.	6%
Phosphorus (P_2O_5)	2%
Potassium (K_2O)	8%
Net Weight 50 lbs.	

Note that in the above example half (6%) of the total (12%) nitrogen present is in a water insoluble form. This means that half the nitrogen in the fertilizer is a slow release type. This characteristic makes it a good turf fertilizer.

Your bidding specifications should specify the following:

1. The total amount of nitrogen (N).
2. The amount of nitrogen in the water insoluble form (W.I.N.)
3. The amount of phosphorus (P_2O_5).
4. The amount of potassium (K_2O).
5. If you want bag or bulk delivery. (If bag—the size of the bags)
6. A statement to the effect that the fertilizer should meet the State standards.
7. A statement concerning your bidding policy.

Table 2. Sample Seed Tag Data

JONES SEED COMPANY
KENTUCKY BLUEGRASS

Lot 21-557-B		Germ.	80.00%
Purity	95.19%	Crop	3.06%
Inert	1.73%	Weed	0.02%

387 annl. bluegrass per 1 b.

TESTED 9-70

Table 3. Bidding Specifications for Turfgrass Seed

A. Amount (lbs.)	Variety	Scientific Name	Percent by weight Purity	Percent by weight Germination
1. 260	Kentucky Bluegrass	*Poa pratensis*	85	80
2. 100	Creeping Red Fescue	*Festuca rubra*	97	85
3. 40	Annual Ryegrass	*Lolium multiflorum*	98	85

B. Seed must have been tested by the State Analytical Services Lab within the past nine (9) months.

C. Seed shall not contain any noxious weed seed as defined by State seed laws.

D. Add your bidding policy statement plus any penalty clause.

BEAUTIFUL!

U.S. Plant Patent 2887

Like beautiful girls, Fylking Kentucky bluegrass lawns offer so much more . . . beautiful color, texture and easy to love and care for. Abundant sideshoots coupled with a thickly branching root system produce an unusually luxuriant turf of thick, cushiony velvet. More disease and weed resistant, drought and traffic tolerant, Fylking has proven superior in 12 years of international tests. It thrives cut at ¾ inch (even low as ½ inch) and makes backyard putting greens practical. Ask for the beautiful one, 0217® Brand Fylking Kentucky bluegrass is now at your local wholesale seed or sod distributor.

Another fine product of Jacklin Seed Co., Inc.

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ECOLOGIZE— RALLY CRY FOR HIGHLAND PARK, MICHIGAN'S BEAUTIFICATION PROGRAM

HIGHLAND PARK, MICH., a city incorporated in the midst of Detroit, has developed a citizen program aimed at improving the ecology. A newly coined word—ECOLOGIZE—has become the rally cry for citizens in their quest for an action program.

One of the most enthusiastic disciples of the Ecologize movement is Edward R. Wujcik, Highland Park's director of public works. He has helped spearhead a continuing program which enlists the aid of both civic groups and citizens.

Official kick-off was May 22 of this year when the mayor, Robert B. Blackwell, issued a proclamation urging "every man, woman and child in this city to cooperate . . . to share the responsibility . . . to do his part to 'Ecologize' . . . this 365-day job . . . for everyone!" Prior to this action the mayor met with local businessmen, civic groups, and school officials to devise the year-round program.

Public Works Director Wujcik believes success of the venture is assured and that it is gaining momentum. To date: businessmen have distributed lapel buttons, bumper stickers, litter bags, and posters to customers; the Junior Chamber of Commerce has developed an ecology flag for businessman use and many have agreed to fly them at least two days monthly; schools have developed and presented special ecology programs; young people have visited various neighborhoods and picked up loose papers; cleanup campaigns have abounded; city vehicles bear ecology decals or bumper stickers; city offices and schools fly the ecology flag; and the City has erected a sign on the main street proclaiming the city-sponsored 365-day ecology program.

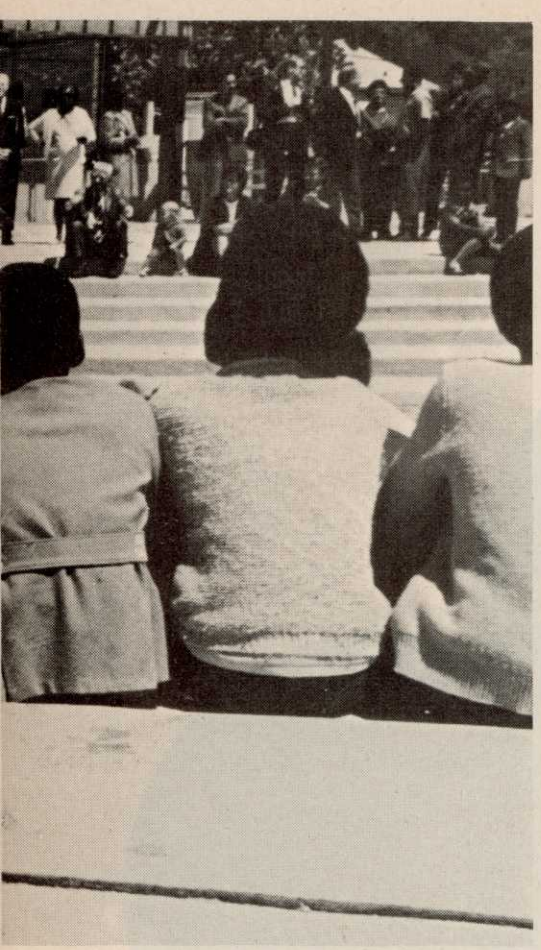
Further, the City Council approved a plan for collection of glass and metal for recycling and is studying a means of collecting newspapers on a regular basis.

A special Ecologize kick-off was a part of the Highland Park annual Michigan Week Parade, with ecology floats being the parade theme. This in itself helped enlist additional civic groups support.

Other steps include a landscape program by the Michigan State University Extension Service which has an office in Highland Park; a series of clean-up projects by the Community Service Cadets, a group of young men aged 10 to 17 who work on such projects through the Model Cities Program; and construction of a small intercity park by students of the Detroit Society of Arts and Crafts. The City provided a $3000 budget for this venture which developed into what Wujcik describes as "a 135 x 200 foot oasis in the middle of the City."

Highland Park, with its many and varied activities, Wujcik believes, has developed an enviable program of public accomplishment.

Editor's Note: ECOLOGIZE is a trademark and service mark of Environmental Rehabilitation Systems, Inc.



The Ecologize kick-off day coincided with Highland Park's annual Michigan Week Parade and became the theme for the event, featuring floats, left and below, along with a park ceremony. In picture above is E. R. Wukcik, the city's director of public works.

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For More Details Circle (125) on Reply Card

SURFACTANTS

By DAVID E. BAYER

ENVIRONMENTAL contamination has resulted in more emphasis being placed on efficiency in using pesticides. Over the last 25 years many workers have shown that toxicity of foliar applied herbicides is enhanced by the use of surfactants. Even with wide use of surfactants, the role they play is probably the least understood of all the agricultural chemicals used today. They increase pesticide performance in the field and also are an important aspect of the formulation.

There is an old widely held idea, that any substance that will increase wetting will serve as a surfactant for any pesticide. Nothing could be farther from the truth. Some of the confusion has arisen because of terminology used by growers and non-technical users when discussing surfactants. The terms most commonly used interchangeably are activator, additive, adjuvant, detergent, soap, spreader, surface-active agent, surfactant, and wetting agent.

An additive is a material added to the spray solution and may or may not be a wetting agent or a surfactant. An adjuvant is a material that assists, aids, or modifies the spray solution in some manner. A detergent is a cleaning agent or solvent and does not necessarily enhance or modify a spray solution. A surfactant is a material which facilitates and accentuates the emulsifying spreading and wetting properties of a spray solution. A wetting agent is a compound which causes a spray solution to contact plant surfaces more thoroughly. It can easily be seen why confusion arises when discussing these compounds but remember that to wet a surface only means to cover or soak that surface with a liquid.

Surfactants come in a wide variety of types and each is designed for a particular use. They may be manufactured from numerous hydrocarbon nuclei and polar functional groups. At present there are several-thousand trade name surfactants available. For simplicity sake they may be grouped into three groups on the basis of their electrical charge, anionic-negatively charged, cationic-positively charged, and nonionic-neutral or no charge.

The non-ionic surfactants are most commonly encountered in agricultural sprays because they are relatively unaffected by water hardness and are compatible with all types of herbicides. Anionic surfactants are the next most commonly used group but they can not be used satisfactorily in hard water or with certain herbicides. However, many commercially available surfactants are blends of the different surfactant types as well as with other chemicals in order to produce a high performance product. Buffering compounds are often used to prevent extremely hard water from interfering with a spray solution. Generally these surfactants are formulated and recommended only when those conditions prevail.

Once the proper surfactant has been selected the next most important factor to consider for increasing herbicide phytotoxicity is the concentration of the surfactant. Wetting of plant surfaces is important to obtain coverage of the plant and in situations when contact herbecides are used this may be all that is desired. However, it has been found that the wetting of plant surfaces does not correlate with the increase in phytotoxicity. Maximum wetting occurs in the range of 0.01% to 0.1% concentration of the surfactant and maximum increase in phytotoxicity occurs in the range of 1.0% concentration. An idealized graph of increased phytotoxicity vs. surfactant concentration would show the main increase in

Dr. Bayer is a research botanist at the University of California, Davis. Prior to joining this research staff in 1962, he was on the California Extension Service staff.

activity occurs between 0.01% and 1.0% on a volume per volume basis (i.e. from two fluid ounces to four quarts of 100% active surfactant ingredient per 100 gallons of spray solution).

The average amount of surfactant to use in most herbicide solutions is approximately 0.1% to 0.5% (i.e. one pint to two quarts per 100 gallons of spray solution). The maximum effect obtained from a given concentration will vary with surfactant and herbicide. Phenoxy type herbicides (2,4-D) generally show maximum increase around 0.2% to 0.5%, while most other types of foliar applied herbicides (dalapon, amitrole, paraquat, etc.) show maximum effects from 0.5% to 1.0%.

Use should be made of this range of surfactant concentrations by taking into consideraton the environmental factors preceding and at the time of spraying. In areas or times of high humidity and cool temperatures the need to include high surfactant concentrations in a herbicide spray solution are less than in areas or at times of low humidity and high temperatures. It must also be remembered that in very adverse weather conditions of extremely hot and dry periods the benefits derived from the use of a surfactant will be lessened. Older plants are generally more difficult to control than are younger plants. Plants suffering from water stress, nutrient deficiency, or covered with dust and insect damage, are more resistant to penetration and movement of herbicides.

Proper selection of the surfactant is of the utmost importance and care should be used to correlate it with the use intended. In some herbicide products the surfactant is formulated in the package sold to the consumer. The surfactant - herbicide choice has been made but the concentrations when mixed for use are often not proper for maximum uptake. When this occurs caution should be exercised in selecting and adding additional surfactant. Remember that even though phytotoxicity of the herbicide is increased by the use of surfactants it may not always be desirable as the surfactant may reduce selectivity thus eliminating species selectivity.

Surfactants are no miracle chemicals but when used properly they will enhance herbicidal efficiency. They will assist in lessening the possibility of damage to desirable plants by allowing the use of lower rates of the herbicide and decrease the cost of the herbicidal application.

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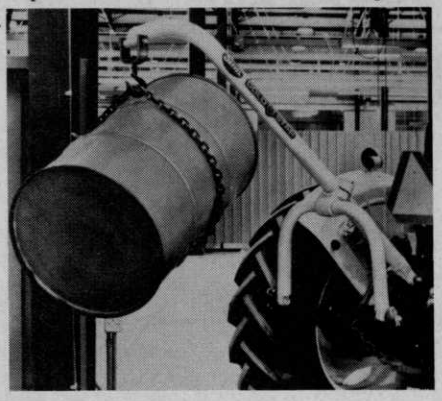

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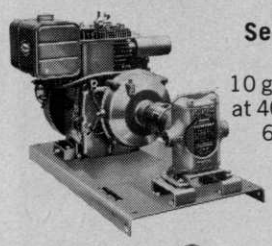

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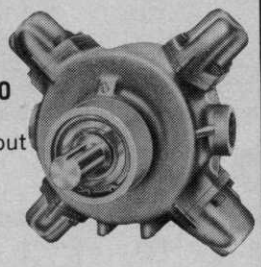

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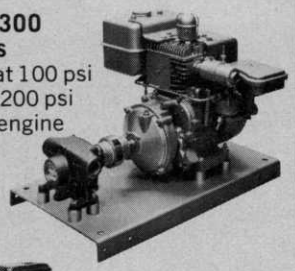

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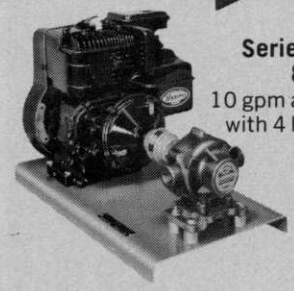

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DON'TS AND DO'S IN CLIENT RELATIONS

By RICHARD A. STEMM

CONSIDERING a consulting career or perhaps engaging in some moonlighting activity? If you are, then you may be interested in some of the do's and don'ts experienced consultants have found to be useful in their client relations.

Building a significant clientele is the goal of every independent practitioner; therefore the continual maintenance of good client relations is a must. The following do's and don'ts are suggested as a guideline. They have withstood the test of time, so they can be considered as being standard practice.

DO

- Dress according to normal standards of a successful man in your field. Avoid extremes and fads.
- Stay clean and well groomed.
- Act as an independent consultant in objectivity and initiative.
- Enjoy and appreciate other's attempts at humor, but only if it is in good taste.
- Avoid discussions involving internal and external politics.
- Keep all confidences, both business and personal.
- Observe protocal and ethics.
- Be sociable on the assignment.
- Accept kudos due you.
- Refuse to engage in discussions involving commissions, kickbacks, or gifts.
- Be objective in all activity.

- Stay within the confines of your contract.
- Accept luncheon and dinner meetings if there is a valid reason for conducting business at such a time.
- Diplomatically avoid involvement in and discussions of personal problems.
- Be a good listener.
- Do your work in good fashion and respect your client's "time frame."
- Respect your client's resources.
- Refuse a contract if you sense insincerity or a conflict of interest.
- Complete your contract and meet your commitments in full.
- Avoid jumping to obvious conclusions or accepting conclusions of others.

DON'T

- Don't act or attempt to conform as an employee in thought, hours, etc.
- Never try to be humorous nor actively join others in their attempts.
- Do not strive for nor lightly accept social invitations or involvements.
- Don't solicit kudos.
- Do not violate ethics, protocol, nor compromise principles.
- Don't offer advice or comments pertaining to things outside the scope of the contract and your specialties.
- Do not name drop.
- Don't be the first to offer a luncheon or dinner, nor make such an offer merely as a marketing gimmick.
- Don't burden clients nor their personnel with your personal problems, interests or needs.
- Never talk to impress yourself with your own words of wisdom.
- Do not knock other consultants, clients, employers or persons.
- Don't "build" on your contract.
- Do not conduct your business on the client's telephone nor use his resources for such without his prior knowledge and consent.
- Never be used for someone's ulterior motives.
- Do not terminate a contract without a valid and due cause, and never just to assume a more personally rewarding assignment.
- Don't short circuit the sequence of data gathering, analysis, synthesis, recommending, and implementing.

ABOUT THE AUTHOR

The author is the Director of the NATIONAL CONSULTING REGISTER which locates and identifies consultants and verifies their consulting credentials for industry and government agencies. He is also the Editor of the bimonthly newsletter CONSULTING NEWS. Office mailing address is P.O. Box 42576, Los Angeles 90050.

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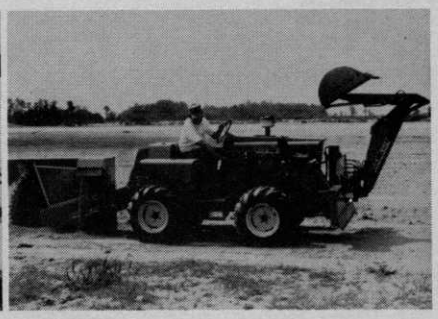
CUT FROZEN EARTH — The Earth Saw cuts trench in completely frozen ground for an electric and telephone service line in Michigan.



CUT CORAL — In a field demonstration in Florida, the Earth Saw slashes through coral formations.

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Pennstar Kentucky Bluegrass.

Perhaps the best all-around turfgrass available today.

Highly resistant to stripe smut, rust and leaf spot. Stripe Smut (Ustilago striiformis) sporlates in May or June, shredding individual leaves. Field trials show that, while Merion is quite susceptible, Pennstar is highly resistant. A very strong plus.

Pennstar is also highly resistant to rust (Puccinia spp). Rated on a scale of 0 (best) to 10 (worst), test data give a 1.7 rating to Pennstar versus 8.7 for Merion.

Most improved bluegrass varieties are resistant to leaf spot (Helminthosporium vagans). However, in university tests, Pennstar was significantly *more resistant* than some improved varieties.

Well adapted from the East Coast to California. Pennstar's disease resistance, drought resistance and other characteristics enable it to do well wherever Kentucky Bluegrass is adapted. It establishes well and resists fadeout under a wide variation in management.

Medium color, good density, easy to manage. With its pleasing medium bluegrass color, Pennstar blends well with other varieties. In mixtures, it's neither too dark nor noticeably light.

Pennstar persists at moderate-to-low fertility levels. It doesn't over-react to higher fertility. Because it's decumbent (the leaf angle is closer to 90° from vertical than 45°) Pennstar can tolerate a close mowing without thinning out. And it's shown the ability to withstand drought conditions better than some other Kentucky Bluegrass varieties.

No excess thatch after 11 years. Pennstar does not produce damaging quantities of thatch. In tests at Penn State, plots of Pennstar torn up after 11 years revealed no excess thatch. (No dethatching had been done in that entire period.) Normally aggressive varieties can be expected to thatch up under good management practices. Not Pennstar.

Ideal component for turf mixtures. Is it better to plant a single variety or a blend? This is the difficult question that confronts turf managers. A single variety planting is undeniably beautiful. Yet a single strain can be destroyed by disease or weather. Which is why Pennstar was developed — to make available a bluegrass variety that would be highly resistant to disease and capable of surviving extreme weather conditions.

These qualities make Pennstar very suitable for a mono-culture. Or a mixture, particularly when considering its other characteristics: It's not overly aggressive. It's easy to manage. Its pleasing texture and middle-of-the-road color make it visually compatible with other varieties. Indeed, Pennstar blends so effectively, it could help convert some managers to mixtures.

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Pennstar Kentucky Bluegrass
(Poa pratensis)

Pennstar is an improved variety that has been released by Penn State after over 15 years of testing and evaluation. Pennstar is outstanding for disease resistance and for compatibility with other improved grasses in turf mixtures. Pennstar is not overly aggressive and is compatible with other varieties. Pennstar is persistent; reasons include its ability to withstand low mowing, its high reisistance to disease and its ability to compete under low fertilization.

Some expert (and unbiased) opinions.

"Disease resistance was good, it had an attractive color, texture, and a good growth habit. The most significant item was its good performance under relatively low levels of fertility."

"In our trials, Pennstar has been the best variety for which seed is available."

"Average quality ratings (9 = best) based on density, color and uniformity placed Pennstar highest with a score of 5.6 as compared to other varieties such as Geary 5.0, Merion 4.0 and Windsor 3.8. These particular plots have been under minimum maintenance and care."

Turf Buyers' Checklist

IDEAL	Pennstar
1. It should be able to survive periods of drought.	1. In field tests, Pennstar has survived extended periods of drought. ☑
2. It should be able to survive with moderate fertility.	2. Pennstar requires only the moderate management typical of most bluegrasses. ☑
3. It should be decumbent in growth habit so it can be mowed short without thinning out.	3. Pennstar's decumbent growth habit permits it to be mowed very short without thinning out. ☑
4. It should not be overly aggressive—should not crowd out companion grasses.	4. Pennstar will hold its own against overly-aggressive varieties, but does not crowd out less aggressive types. ☑
5. Its color should not be so dark or so light as to give a mixture a mottled appearance.	5. Pennstar has a pleasing medium blue-green color that blends well with all other varieties. ☑
6. It should not "go wild" when fertilized. Emergence and growth rates should be moderate.	6. Pennstar's rate of growth is not overly affected by increased use of fertilizers; its emergence and growth patterns are moderate. ☑
7. It should not produce excess thatch, even after years of establishment.	7. Pennstar produced practically no thatch in 11 years of testing. ☑
8. It should be highly resistant to common diseases, and particularly to "killer types" such as stripe smut and leaf spot.	8. Pennstar is practically immune to leaf spot, highly resistant to stripe smut. ☑
9. It should be widely adapted throughout the zone of species adaptation.	9. Pennstar is widely adapted from California to the East Coast, in all the normal bluegrass areas. ☑
10. It should be well tested for a period of years over many locations so that its characteristics are well understood.	10. Pennstar has been tested for 15 years in locations from coast to coast. ☑

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☐ Please send me prices, availability, test information, purity and germination data on Pennstar Kentucky Bluegrass.

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Wilsco FoamSpray Now Readily Available

Wilsco FoamSpray is a patented chemical additive used in herbicides and insecticides which, when sprayed through specially engineered Wilsco foam nozzles, converts the usual tiny liquid droplets emitted from sprayers into foam.

It has the ability to control potentially dangerous and damaging drift; is readily visible; produces better coverage; has a slower rate of evaporation, and produces larger droplets. FoamSpray is also excellent spreader/sticker even when its foaming characteristics are not needed in a given spray operation.

FoamSpray can be used in all conventional spray equipment — hand, boom or aerial — capable of 40 or more pounds pressure per square inch, according to the company.

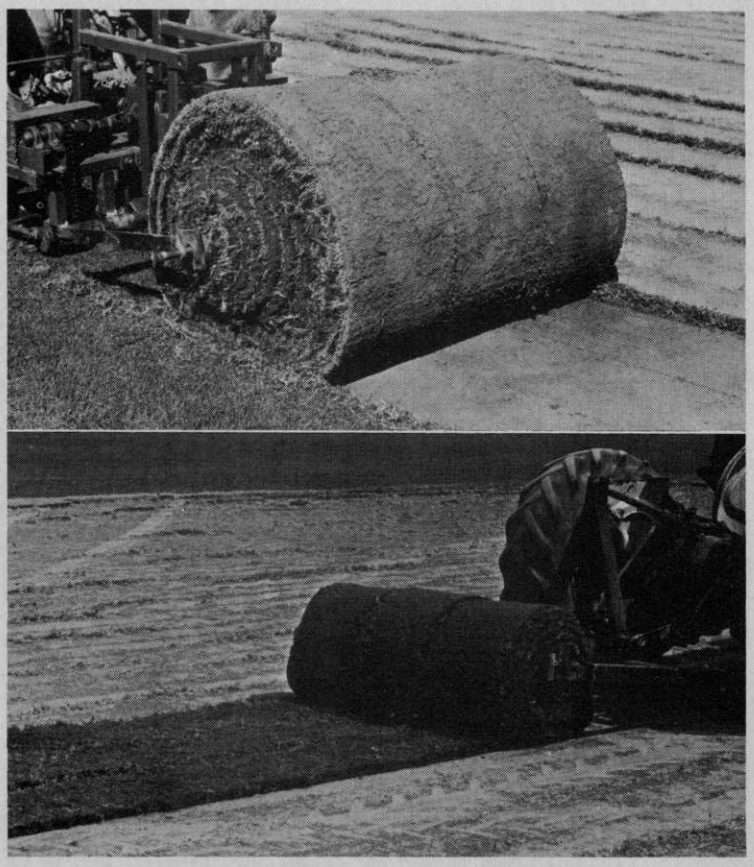
FoamSpray is completely soluble in water and offers complete acceptance when mixed with water. Two quarts of FoamSpray per 100 gallons of spray solution is the mixture ratio used in most applications. However, 24D and 245T require three to four quarts of FoamSpray per 100 gallons. In some applications, the ratio may be reduced to one quart per 100 gallons. It is not corrosive.

Mixtures with various oil combinations are also possible and practical.

Wilsco foam nozzles replace present nozzles simply and quickly and inject air into the solution, forming the foam. Five different nozzle designs cover all normal spray operations.

FoamSpray has been proven particularly effective when used along highway, railroad and power line rights of way; in parks and around public institutions and in aerial and large-scale ground applications.

R. L. Wilson Co., Inc., 6720 Weaver Road, Houston, Tex., is the manufacturer of FoamSpray. Wilson is a subsidiary of Service Technology Corporation, Dallas, Tex. Service Technology is a subsidiary of LTV Aerospace Corporation, also of Dallas.



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Special Aquatic Section For Southern Weed Conf.

An extensive aquatic weed program is scheduled for one section of the Southern Weed Science Society meeting at Dallas, Tex., Jan. 18-20.

Chairman of the aquatic and special weed section, Richard Couch, Athens College, Athens, Ala., reports that two special symposiums are planned. The first will have to do with the environmental impact of aquatic weed control and the second will summarize the current status of this type weed problem in the southeastern United States.

Featured on the first symposium will be Howard Zeller, Environmental Protection Agency, headquartered at Atlanta, Ga. Robert Blackburn, Agricultural Research Service, Ft. Lauderdale, Fla., is also scheduled for this section.

Oil-Dri Flies For Patent To Pelletize Clay Waste

A new process to pelletize fine particles of absorbent clay is being researched by Oil-Dri Corporation, Chicago.

A patent for the process has been filed for by Rudolph Valenta on behalf of the company. Valenta is vice-president of production and development for Oil-Dri.

The clay particles, now a by-product waste material at the company, are being tested for a number of uses, notably as a decorative ground cover and as a carrier for pesticides.

City Ordinances Needed For Urban Tree Protection

Urban tree root systems often suffer severe damage during construction and need to be protected. This is the thinking of Dr. Carl E. Whitcomb, ornamental horticulturist at the University of Florida. He is advocating city ordinances to protect trees and the root systems that support them. Otherwise, he believes, they will end up dying.

Despite the fact that many developers and cities proudly proclaim they have "saved the trees", many root systems are severely damaged during construction, he has stated.

Speaking at a shortcourse on urban forest management recently before 48 city planners and other officials, Dr. Whitcomb pointed to the city of Atlanta, Ga., which has a tough new landscape ordinance to protect trees and their root systems. Trees in Atlanta, he said, cannot be removed without city authorization, and root systems must be protected.

He stressed that urban trees must endure more environmental stress. "Once root systems are damaged. trees become more vulnerable to insects, disease, and stress, especially during drought periods. Such damage usually means the beginning of the end," he said.

Added to the problem of root damage are 90 to 110 degree (Fahrenheit) soil temperatures which can stop root growth and hasten death. Trees growing in narrow areas adjacent to parking lots or between sidewalks and streets are affected by this type of heat stress generated by the paving.

Because as much as 80 percent of a tree's root system is in the upper ten inches of soil, it is particularly susceptible to damage from roto-tilling or soil compaction which cuts off oxygen.

Whitcomb also questioned the widespread practice of building sidewalks in a straight line if tree roots must be cut for the right of way. Instead, he said, sidewalks should be built around trees to protect roots.

He said young trees that have been planted in confined growing areas will usually adjust to these conditions, resulting a healthy but dwarfed plant.

Finally, the ornamental horticulturist warned that too much urban land is being turned into an asphalt jungle which causes flooding and restricts the regeneration of the natural water supply.

Most downtown areas are essentially 100 percent covered with some type of impervious paving, except for a few token plantings. Apartment complexes cover about sixty percent of the soil.

Even suburban sub-divisions, widely touted by developers for their "unspoiled natural beauty," cover 35 to 40 percent of the land with some sort of paving, adding to the water re-charge and runoff problem.

Association Solicits Landscape Design Project Entries

Entries for the National Landscape Association award program must be submitted by Nov. 15.

Landscape design professionals may submit material on projects, complete with drawings, photographs, etc. to association headquarters, 832 Southern Building, Washington, D. C. 20005. Entry forms are also available from this office.

Awards will be presented at the group's annual convention at the Royal Sonesta Hotel, New Orleans, La., in February, 1972.

SOD
INDUSTRY
SECTION

'WHY WE DEVELOPED THE BIG ROLL SYSTEM'

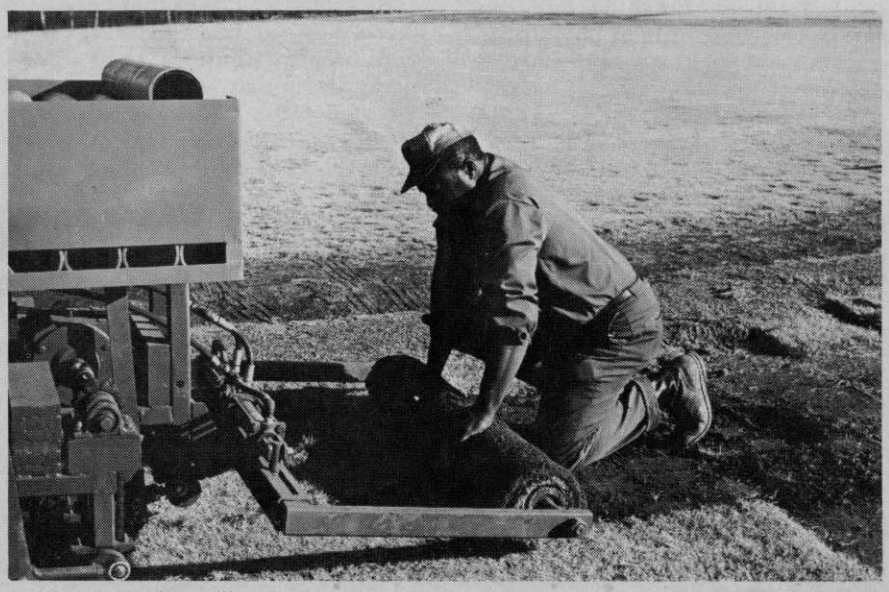
By MARTIN BECK
BECK MANUFACTURING CO., Auburn, Ala.

1. Big rolls can be loaded 2 or 3 at a time with a fork lift. They can be stacked 2 or more layers high on a truck.

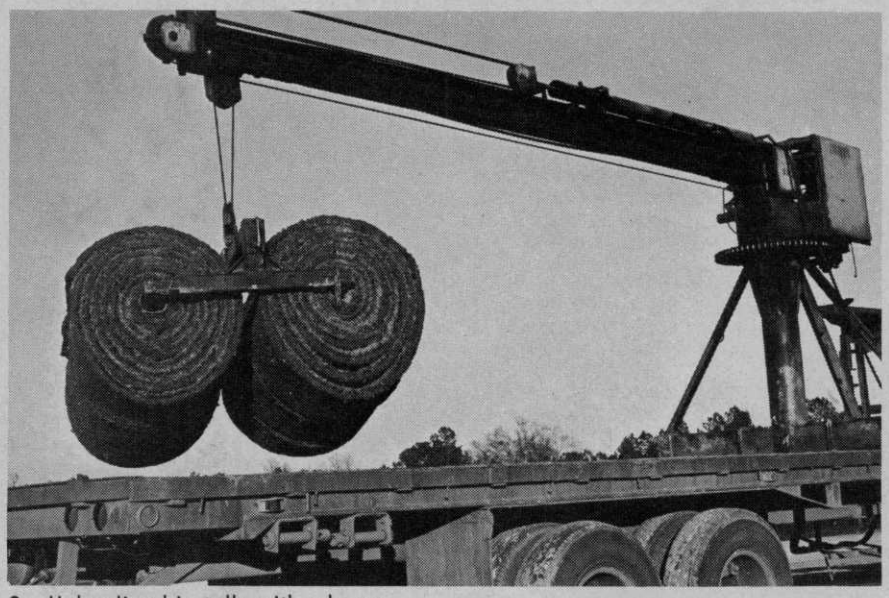
The total installed cost of sod is often the figure that determines whether a lawn is seeded or sodded. We, like most other sod growers, have always tried to keep our equipment up to date and to keep our costs down so we could grow quality sod at a competitive price. We always relied on service to our customers as a major part of our sales effort. It seemed that there was a considerable amount of equipment available to the sod producer, but almost none that would reduce the back-breaking labor of laying sod on the job. If we could help our customers lay sod more economically, they would get more jobs and we would sell more sod.

Following that line of thought, and considering all the various sizes and shapes that sod was cut, it seemed that a large roll offered the best overall chance of success for a completely mechanized harvesting and laying system. Sod had been produced in every conceivable size that a man could handle. We would produce it in a size that a man could **not** handle! That would mean that machines, not men, would be doing all the hard work.

Early tests of the basic idea showed that sod could be rolled into rather large rolls, then unrolled with a tractor. However, development of the hardware needed to turn this into a practical method of harvesting, loading and laying sod was slow. We finally settled on a four foot roll width which, loaded end to end, fully utilized a truck bed width and yielded a roll of a size easily handled with a typical landscaping tractor. Three 16 inch wide cutters were selected to provide a



2. Starting a big roll is easy.



3. Unloading big rolls with a boom.

machine that would follow irregular ground contours with minimum mechanical complexity.

Our pilot model was completed about one week before the 1970 American Sod Producers Association show in Illinois, and we left for the show without knowing whether it would work with bluegrass or not. As it turned out, the system worked perfectly, although the equipment was not fully perfected and we were inexperienced in its use. We have since greatly improved both the harvesting and the laying equipment as well as the methods of its use. Loading and unloading are easily accomplished with either a fork lift of a boom.

We have adopted wax coated, cardboard tubes 4 inches in diameter, and costing $.30, as being most economical for our operation. Aluminum or steel tubing can also be used, although they are somewhat more expensive. It is possible to cut the cardboard tubes into 16" lengths and use a removable metal sleeve to hold them together during harvesting and handling. The sleeve is removed at the job site, and the resulting 16 inch wide rolls of about 7 or 8 yards each can be moved about and laid by one man using a small hand truck device. However, the basic system is so versatile and satisfactory that we are not using the hand trucks at this time. We also experimented with a number of other handling devices, but found them to be largely unnecessary.

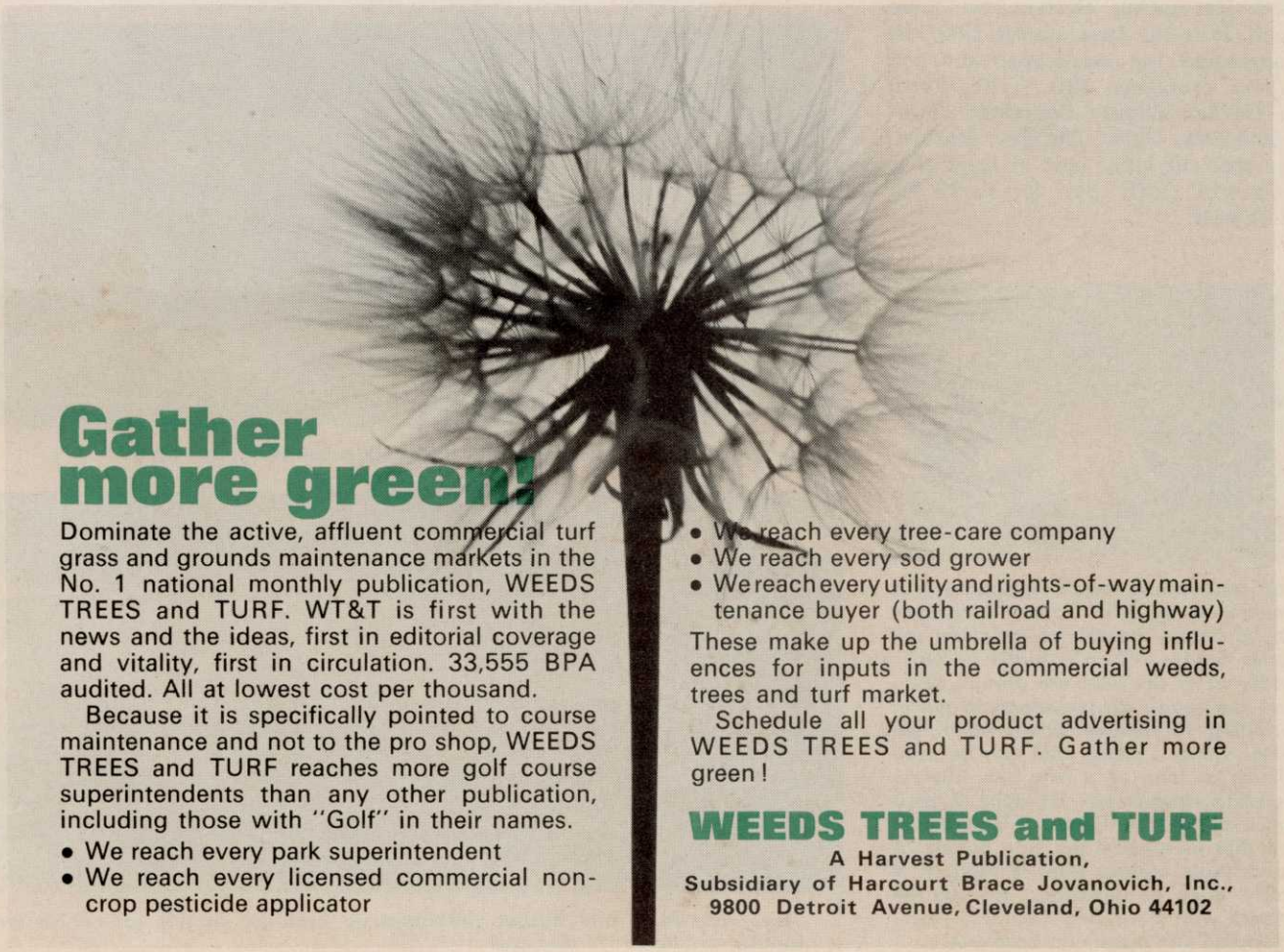
Two of our main worries in the beginning were broken sod strips in harvesting, and obstructions such as trees and ditches in the laying process. Both were quickly found to be unimportant. Broken strips, such as might occur at a weak point in the sod, can be wound up with no loss of sod. Obstructions are simply bypassed with the tractor during laying, and the sod is pulled into place with a rake. This goes very fast, and permits laying sod on fairly wooded lots. On small lots, we suggest laying the largest areas with a tractor first, then using the end pieces to patch and fill in irregular areas. Two men can carry and lay a small part of a roll, or one man can cut it into strips of the desired size with a sod knife.

Very steep slopes and ground too soft to drive on with a tractor are not suitable for laying with present equipment. However, a winch type device for unrolling the sod on a slope and a light weight, high-flotation tractor for soft areas could be produced if the demand develops.

This is our first full year to use the big roll system. Some of our customers were skeptical at first, but all were enthusiastic after they tried it, and want to use big rolls whenever they can. I know of several large orders we have gotten because of the economies in laying sod by this method. Big roll systems are in use in Kansas, Illinois, Ohio, Maryland, and Rhode Island. These sod growers have all reported excellent results. In general, the first people to see the advantages are the growers who also lay their own sod.

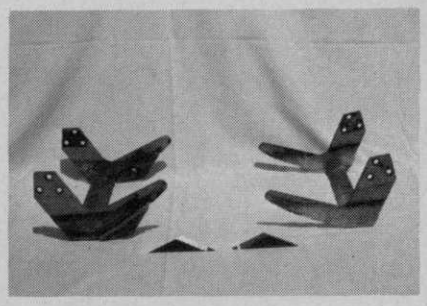
We have a number of garden center customers who sell sod in blocks, and of course the big roll system is not practical for that trade. We will always have to cut sod in blocks for these people, and for that purpose we have built a cross cutter attachment for our 3-gang cutter that can cut the strips to any desired length. We have placed a number of these in Florida and other states. This makes it possible to cut big rolls, blocks, folded slabs or small rolls with the same machine.

In the planning state for next Spring is an elevating harvester that

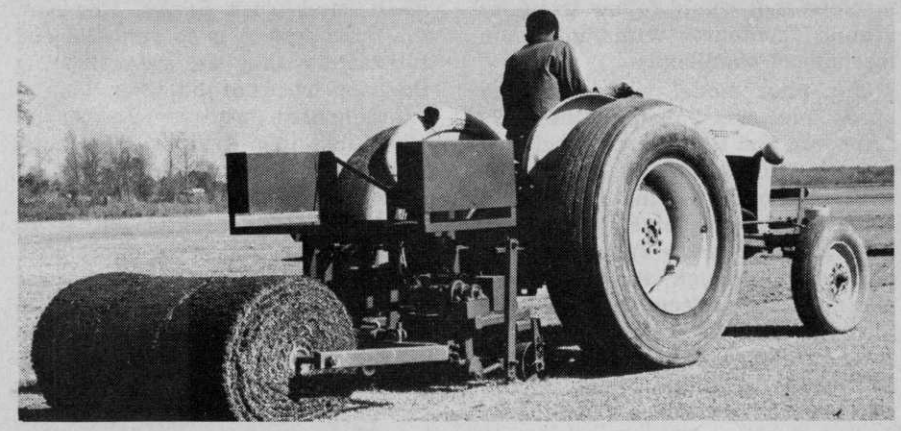


will permit economical pallet stacking of blocks, folded slabs or small rolls. This elevator will be an attachment for the present cutter.

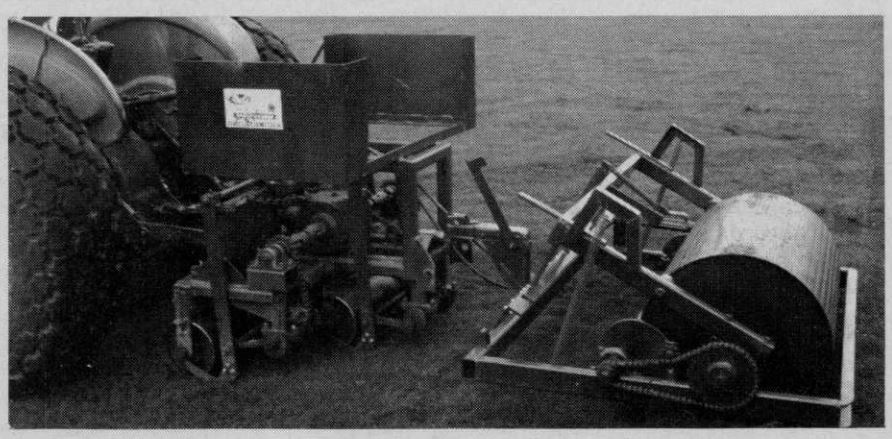
Following are statements made by some of the users of our Beck Sod-O-Matic: Bob Miller, Rogers & Miller Sod and Landscape Service, Spring Hill, Kan.: I am way ahead justing getting it on the ground, not counting the savings in placing the sod; Brian Bouchard, Kingston Turf Farms, West Kingston, R. I.: Crews can harvest and lay sod hour after hour without fatigue; Joe Wolf, Triangle Sod Farms, Inc., Ft. Lauderdale, Fla.: In this highly competitive market we are in a much better position; Tom Gerdes, Gerdes Turf Farms, Xenia, O.: It is the coming thing; Roy W. Georg, Roy W. Georg Landscape Service, Severn, Md.: Good labor saver, also quicker, easier, and a better looking job; Bill Wandell, Sod Now, Inc., Urbana, Ill.: It has saved our hide this year. We have gotten jobs we would not have otherwise; Mac Broward, Broward Sod Company, Ft. Lauderdale, Fla.: After using the Sod-O-Matic using anything else makes me unhappy; Ray Christopherson, Northern Turf Supply Company, Eau Claire, Wis.: The Sod-O-Matic is the most flexible Sod Harvesting System we have seen. It is the first system that has considered the landscaper and sod layers problems; Bill Smith, Farm & Garden Supply Company, Oklahoma City, Okla.: The Turf Harvester will cut labor cost at least 25% and will easily pay for itself the first year.



Sod cutter blade repair kit, (photo) was developed by Beck Zoysia & Nursery Co. to reduce the cost of replacing sod cutter blades. When a blade becomes badly worn, the sides are ground down and the repair kit is welded in place. Grinding to remove excess weld material yields a blade that can be used almost as long as a new one. The rebuilding process can be done 2 or 3 times before the bottom blade wears too thin to support the side blades. A hardenable carbon steel is used. It is fairly hard as supplied, but can be heated with a welding torch and water quenched for maximum hardness.



4. Once a roll is started, it rolls up by itself.



5. Cross cut attachment can be made to cut any length.

6. Rolls are easily transported and laid with a landscaping tractor.

7. Trees, sidewalks and ditches presented no problem on this job which was laid by an inexperienced crew.

meeting dates

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Helicopter Association of America western operators management seminar at the Marriott Inn, Belmont, Calif., Oct. 19-23.

Lawn and Ornamental Seminar, Florida Horticultural Sprayman's Assn., Pier 66, Ft. Lauderdale, Fla., Oct. 29-30.

Missouri Turfgrass Conference in the Memorial Union, University of Missouri, Columbia. Nov. 3-4.

Wisconsin Golf Turf Symposium at the Pfister Hotel, Milwaukee, Nov. 4-5.

Lawn & Garden Distributors Assn., Annual Convention, Sheraton O'Hare Motor Motel, O'Hare Airport, Chicago, Ill., Nov. 4-5.

Kentucky Plant Food Council, Annual Meeting, The Executive Inn, Louisville, Ky., Nov. 10-11.

National Institute on Park and Grounds Maintenance, Park Maintenance, Sheraton-Schroeder Hotel, Milwaukee, Wis., Nov. 15-18.

Colorado Crop Protection Institute, Colorado State University, Ft. Collins, Nov. 17-18.

Arizona Parks and Recreation Conference, annual meeting, Holiday Inn, Tempe, Ariz., Nov. 17-19.

Metropolitan Shade Tree Conference, 300 N. Park Drive, Arlington, Va., Nov. 18.

National Agricultural Aviation Association, Fifth Annual Conference, Fairmont Hotel, Dallas, Tex. Dec. 5-9.

Texas Turfgrass Conference, Texas A&M University, College Station, Tex., Dec. 6-7.

North Central Weed Control Conference, 26th Meeting, Muelebach Hotel, Kansas City, Mo., Dec. 7-9.

Ohio Turfgrass Conference and Show, Cincinnati Convention Center, Dec. 7, 8, 9.

Northeastern Weed Science Society, 1972 Convention, Hotel Commodore, New York, N. Y. Jan. 5-7.

Georgia Golf Course Superintendents Association, Annual Meeting, Augusta Golf Clubs and Holiday Inn, Augusta, Ga., Jan. 9-11.

Western Association of Nurserymen, 82nd Annual Meeting, Plaza Inn, Kansas City, Mo., Jan. 9-11.

Mid-Atlantic Golf Course Superintendents, Annual Conference, Holiday Inn Downtown, Baltimore, Md., Jan. 10-11.

New Hampshire Turf Seminar, University of New Hampshire, Durham, Jan. 13-14.

Southern Weed Science Society, Annual Meeting, Statler Hilton Hotel, Dallas, Tex., Jan. 18-20.

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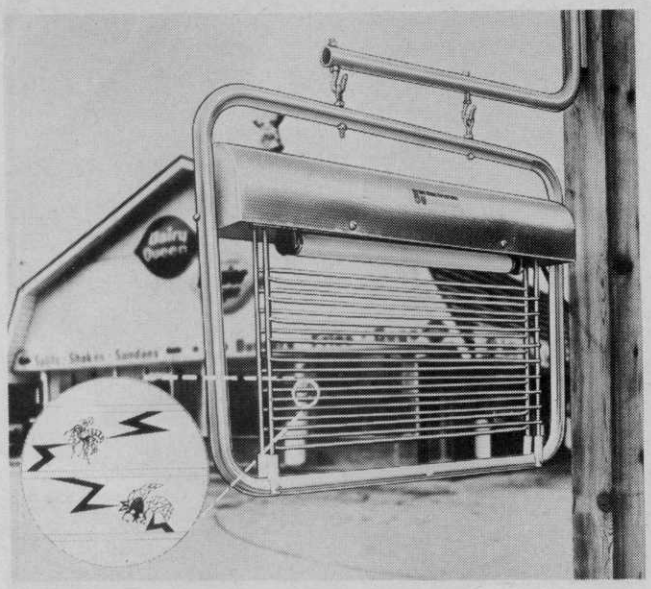
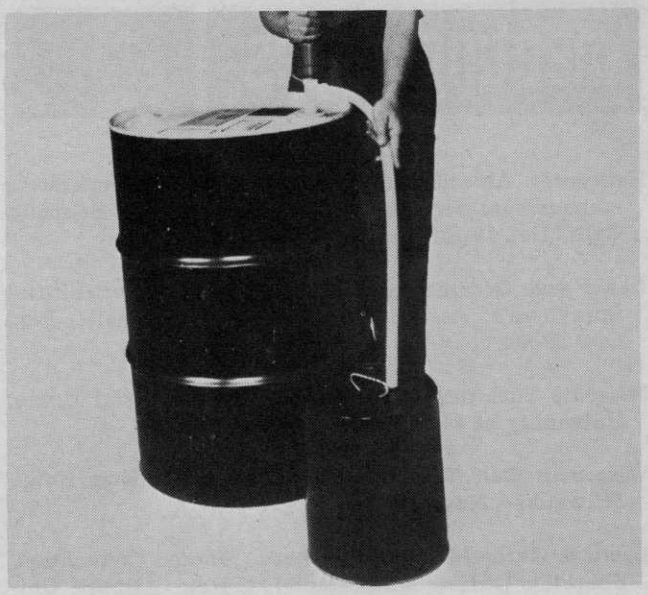


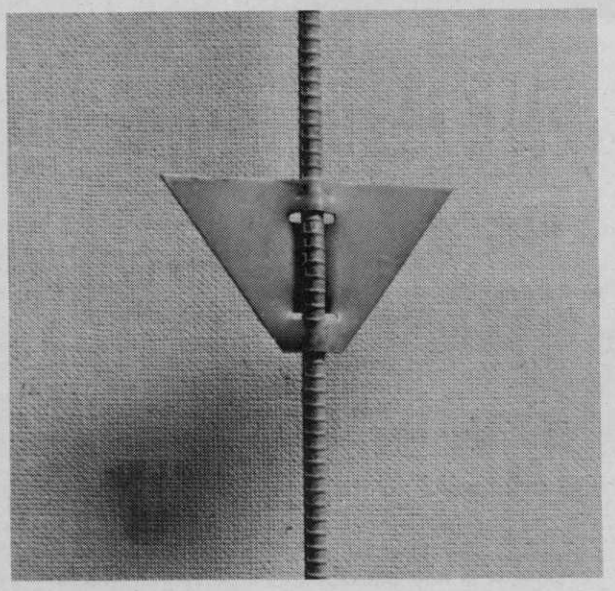
GRID INSECT KILLER: Hub States Corporation, Indianapolis, Ind.

Lectro-Lur, a new low cost electrically charged grid type insect killer attracts bugs with black light. To insects the black light appears many times brighter than brightly lit signs or buildings. Once insects come into contact with the electric grid they are killed. Unit contains no moving parts, is weather proof, totally safe and operates for less than 2¢ per day. For more details, circle (701) on the reply card.



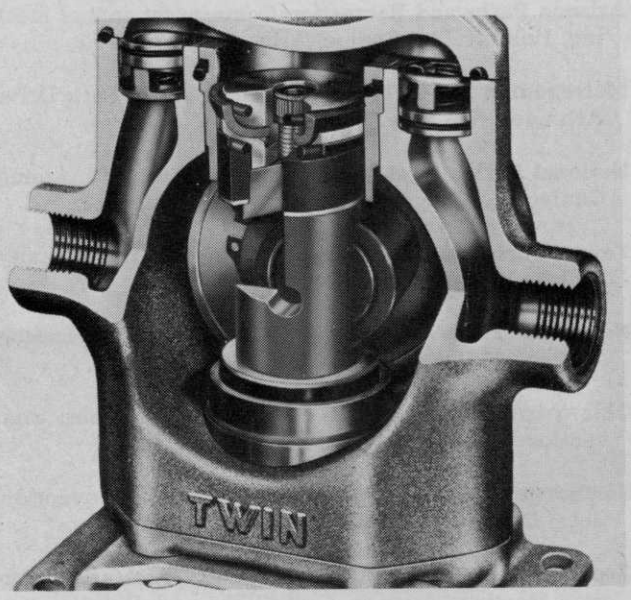
PLASTIC SIPHON PUMPS: Unique Distributors, Burbank, Calif.

Fast starting, large volume flow polyethylene siphon pumps eliminate manual pumping of 1, 5 and 55 gallon containers. Model HD-76 will pump water at the rate of 1¼ gallons per minute. Model HD-111 will pump water at the rate of 2 gallons per minute. Can be used for soldering fluxes, flux removers, commercial solvents and other liquids, except concentrated acids, iodine and silver nitrate. Flow stopped instantly by opening vent. No leakage problem with fully enclosed liquid chamber. Model HD-76, $2.95 each; Model HD-111, $9.95 each. For more details, circle (702) on the reply card.



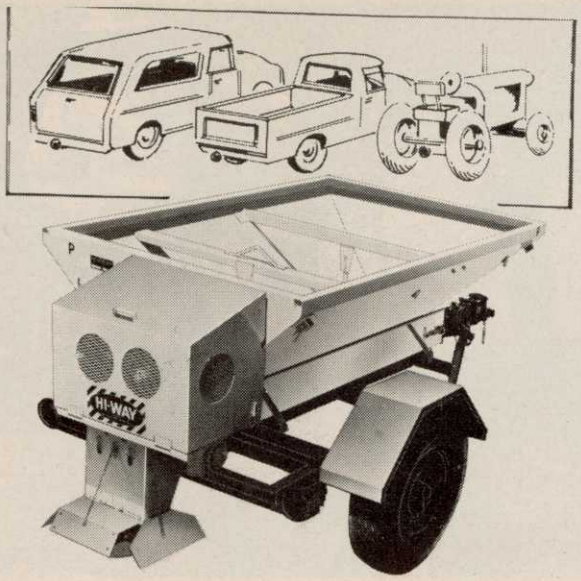
ELECTRIC FENCE POSTS: Spannar, Inc., Grandy, Minn.

Metal fence posts feature for fast, easy soil penetration. Easy installation, strength and low cost makes posts ideal for uses without electrical hook-up. Available in three models: No. 600 plate type, 54" arrow rebar, features pointed prong and sturdy triangular 15 gauge steel foot and anchor plate positioned to allow standard 40" above ground exposure. Ruggedly constructed, post is threaded through the anchor plate and then stamp formed to secure the plate into locked position. The wide plate allows step to push into soil with either foot or both feet in hard ground. Dip coated aluminum. Model 604 is 48" in length with smooth steel post. All posts are ⅜" diameter reinforcement rod and are available with porcelain insulators if desired. For more details, circle (703) on the reply card.



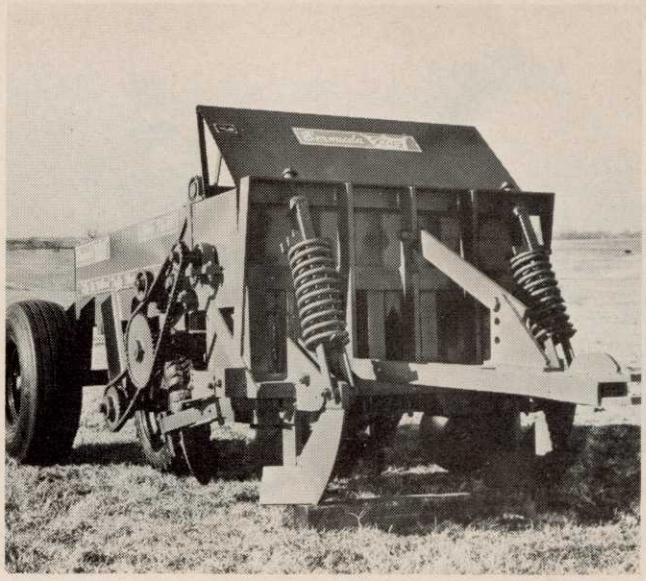
CRANKPIN BEARING, Hypro Div., Lear Siegler, Inc., New Brighton, Minn.

New crankpin bearing design permits longer intervals between greasing in Hypro Series 5200 and 5300 pumps. Design reduces lubrication to 100-hour intervals as contrasted to a "daily greasing schedule" in prior models. Offset in a stainless steel shaft and drives pump's twin pistons. Regular shaft bearings are factory lubricated and do not require a regular greasing schedule. Other pump parts are lubricated by the liquid passing through it. Pumps are available in a choice of materials to suit the customer's needs: economical cast iron for regular pumping service, nickel-plated cast iron for extra resistance to corrosion and erosion. Series 5300 pumps are also available in bronze for application of aluminum brighteners and other acid cleaning solutions. For more details, circle (704) on the reply card.



UTILITY SPREADER: Highway Equipment Company, Cedar Rapids, Iowa

Self-powered, self-contained HI-WAY Model "P" utility spreader quickly converts any truck, pickup, flatbed or dump body into a "spreader." Can be mounted on a HI-WAY Model "PT" trailer and remotely controlled for one-man operation while being towed behind any vehicle; a station wagon, truck or tractor. For more details, circle (705) on the reply card.



GRASS PLANTERS: Bermuda King Company, Okarche, Okla.

Compact grass planters for faster and economical machine planting of grasses in areas as estates, acreages and golf courses, where larger and heavier machines were formerly restricted. New one- and two-row machines are not only lighter and more maneuverable, but require less horsepower for towing. Will plant Bermuda and a variety of other sprig-root grasses. Of the same durable construction as preceding, heavy-duty Bermuda King Standard Two-Row Planter. Working parts interchangeable with the larger machine. For more details, circle (706) on the reply card.

WOOD SPLITTER: Lupton Tree Service, Tiffin, Ohio

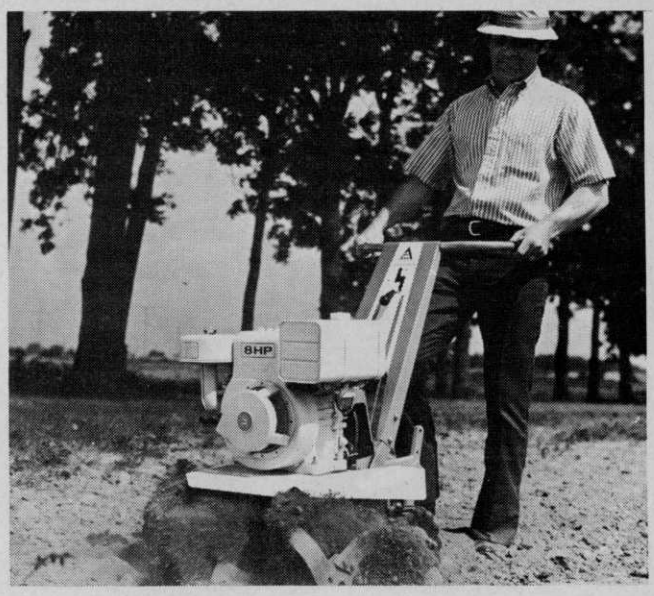
Wood Splitter accessory for backhoe built by Lupton Tree Service, replaces backhoe bucket in less than five minutes. Ruggedly constructed. Maintenance free. A good way for the backhoe owner to split a lot of wood with a comparatively small investment. Available for all size backhoes. Also available with or without remote control valve. For more details, circle (707) on the reply card.

VACUUM COLLECTOR UNIT: Hesston Corp., Industrial Div., Hesston, Kansas

Accessory to Hesston's front runner grounds maintenance tractor, makes clean sweep of clippings, leaves, and litter. Cleans as it mows, can be used with either the 48" or 60" mower, and is self-contained vacuum pickup unit. Blower is powered by the front runner's 14-hp engine. A 6" diameter hose attaches to mower discharge chute to feed material into the 20-bu. capacity collector box. No additional blower or extra trailer needed. Snorkel attachment for the vacuum pickup cleans out areas inaccessible to tractors. Its 15-ft. length reaches under shrubs and other hard-to-clean places to suck up leaves and litter. Also 6" in diameter, the tube handles the biggest of leaves without clogging. For more details, circle (708) on the reply card.

VIBRATORY PLATE COMPACTORS: J I Case Company, Racine, Wis.

J I Case's marketing two direction-reversing plate-type soil compactors through Vibromax Corporation, a new subsidiary. Units are both for heavy-duty surface and below-grade compaction, and will handle a wide variety of granular and cohesive soils and materials. Model ATN 1000 compacts up to 16" deep, with capacity up to 6300 sq. ft./hr. with plate extensions. A simple control lever changes compactor direction. The ATN 2000 compacts up to 31½" deep, will cover up to 12,800 sq. ft./hr. with extension. For more details, circle (709) on the reply card.



ROTARY TILLER: Allis-Chalmers, Milwaukee, Wis.

This 8 hp walk-behind rotary tiller with horizontal shaft drive and two speeds forward is one of four tillers Allis-Chalmers has introduced. Other models include a 3½ hp, with vertical shaft drive, a 5 hp with horizontal shaft drive and 5 hp with cabin drive. All models have synchronized tine spacing and balanced weight distribution over the tines. Other features include Briggs and Stratton gasoline engines with Kool Bore design, spring loaded idler pulley clutching, sixteen tines guaranteed unbreakable, and variable tilling width from 12 to 26 in. with extensions up to 40 in. All models are horizontal in style except for the 3½ hp which is vertical. For more details, circle (710) on the reply card.

CHIPPER-SHREDDER: Oregon Saw Chain Div., Omark Ind., Portland, Ore.

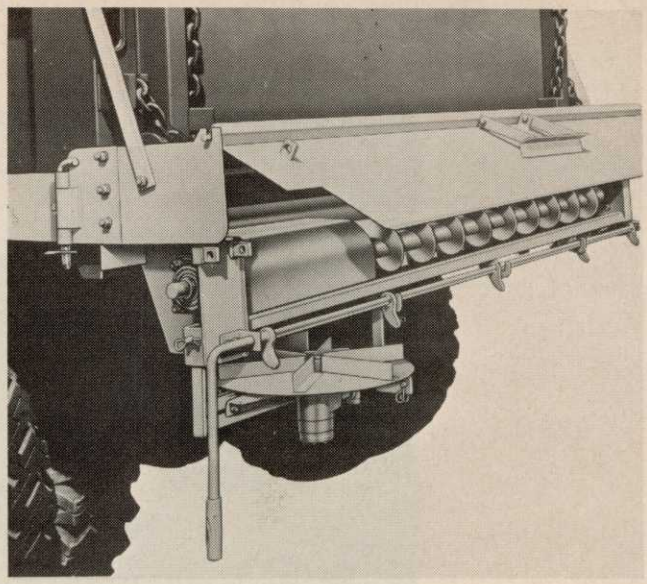
Chipper-shredder chips and bags leaves, twigs, coarse vegetation, tree branches up to 3 inches diameter and even paper that are automatically bagged ready for disposal. Residue can be used as compost. Low-profile unit has low center of gravity and moves easily on two wide tread wheels. It has an 8-horsepower gasoline engine and two hoppers — one for shredding and one for chipping. Cutting mechanism rotates on sealed bearings and all moving parts are fully enclosed for safety. Rubber curtains are installed in the hoppers to protect the user against possible kick back of materials being shredded. For more details, circle (711) on the reply card.

LIGHTWEIGHT BLOWER: The Vandermolen Corp., Livingston, New Jersey

KWH 7-11 Fastblo wheeled blower provides a high velocity, 180 MPH airblast powered by a Sachs 2 Cycle Engine. Weighs 48 pounds and a number of maintenance advantages including no crankcase oil. By revving up almost twice as high as blowers with 4 cycle engines, more high velocity air is generated by the 7-11. Machine can be operated on steep slopes with no worry about burning out the engine because of lack of lubrication. The 2 Cycle, snow mobile type engine starts quickly in any weather. Four rubber shock absorbers hold the engine to wheeled chassis and eliminate vibration. For more details, circle (712) on the reply card.

EVERYTHING MACHINE: Air Rake Mfg. Corp., Chicopee, Mass.

"Everything Machine" is a basic air rake unit with interchangeable attachments which convert this basic unit into five different job-functioning machines. With the basic air rake unit, leaves and other lawn debris can be quickly raked and collected by air power rather than the much slower, conventional method of hand raking. With the unit's finger-tip throttle control positioned on the handle bar, the operator can quickly adjust the air thrust to fit the terrain and ground conditions; on open stretches of lawn, an air rake — at full throttle — can rake a swath of up to 5′ to the side in a single pass, while in confined areas such as around foundations and trees, the unit may be throttled down for short distance raking. With the air rake, leaves and debris may be worked into windrows or piles for collection just as one does when raking by hand. For more details, circle (713) on the reply card.



SELECTO-SPREADER: Central Engineering Co., Inc.,

All-purpose precision hydraulic tailgate spreader includes a self-cleaning hopper. A single self leveling spinner, hydraulically operated, cab controlled, under the tailgate type of spreader with **Swing Out** rear wall of hopper. Selecto-Spreader model S-330, has a one piece completely removable combination cover and rear wall, which serves as the entire back wall of the hopper and "swings out" to provide easy removal of foreign objects and "self cleaning." When used in the cover position it permits dumping over (or under) the tailgate without material entering the hopper. When used as the rear wall of the hopper, it is locked in place by a positive locking mechanism. For more details, circle (714) on the reply card.

TRENCHER: Vermeer Mfg. Company, Pella, Iowa

Compact, low-cost service line trencher designed for simple, easy operation is powered by a 14 hp, 4-cycle, air-cooled Kohler engine and features a simple, hydrostatic drive control. Single control lever lets the operator change speeds and direction instantly . . . with no clutching or shifting required. With a heavy-duty 29,000 lb. test digger chain, the M-147H digs 3-5″ wide, down to 30″ deep . . . at speeds up to 20 fpm. A handy 16″ x 42″ dozer blade attachment on the front end of the tractor permits fast, efficient backfilling. Blade angles a full 30° left or right. For more details, circle (715) on the reply card.

LEAF MULCHER: J & S Company, Danville, Ind.

New design in leaf mulchers utilizes the principal of the vacuum created and the rotating blades of any rotary mower or lawn tractor to draw by suction and cut and shred leaves, grass or garden debris. The unit is simply placed on the ground and, as the material is then swept or raked in, the mowing unit placed above the discharge end quickly and efficiently mulches the leaves or other debris. Unit is constructed of 16 gauge galvanized steel. For more details, circle (716) on the reply card.

Ditch Witch

INDUSTRY INNOVATOR

Top-of-the-line Ditch Witch trenchers now has 65 hp and boasts both main- and service-line capabilities. Unit trenches to depths of 7 feet, widths of 24 inches at speeds up to 2000 feet per hour; will lift self off ground. New earth saw, pictured at top of page, is making a cut thru reinforced concrete.

Ditch Witch—a division of Charles Machine Works at Perry, Okla.—is putting some innovative equipment on the market which promises to revolutionize some aspects of the industry.

Long a maker of small trenching equipment, and later of vibratory plow units, the company has just introduced the revolutionary earth saw, a unit which literally saws its way through most anything including 8-inch reinforced concrete pavement. This market innovation follows the recently developed roto witch, a unit which fits most of the Ditch Witch line of power trenchers and permits continuous trenching under streets, sidewalks and similar surface obstructions. The trenchers themselves vary from the largest unit, a 65 hp unit to a small 25 hp self-propelled vibratory plow unit for laying cable and irrigation lines.

President of the company, Edwin Malzahn, speaking to the trade press at a special demonstration of the new line recently at Chicago, said that the first trenching equipment was built 23 years ago. The company, he said, experienced some lean years of growth but that last year (based on US Department of Commerce data) manufactured and sold 50% of all such equipment. The present plant at Perry covers nine acres.

Product lines besides the aforementioned include a full line of attachments for most power units which include backhoes and front-end loaders. Several multi-use models will handle a combination of trencher, vibratory plow, backhoe, front-end loader, and the roto witch. The larger power unit also utilizes the earth saw as an accessory.

The units are being used more and more for uses other than industrial. Tree care companies and nurserymen in the Chicago area are using some of the small trenchers for digging tree balls and for root pruning prior to digging. Nurserymen, especially, find the smallest trencher, a non-riding handle bar model, especially adaptable to narrow rows when root pruning and digging ornamentals.

The Ditch Witch line is sold through company dealers in every state of the union, and in Canada, Europe, South America, and Australia.

Press tent at Chicago Ditch Witch product showing. Editors see one of combo series in action. These units in various sizes do five different trenching operations, without changing or adding attachments. Combo trenches, backfills, does vibratory plowing, backhoeing, and boring.

Edwin Malzahn, president of Charles Machine Works, Inc., right, discusses VP 12 unit with Warren (Doc) Jordan, president of Jordan-Kumler advertising agency at Oklahoma City. The 25 hp unit which lays both cable and irrigation lines has plow on front, and is built to fit the normal lawn gate.

On hand for Ditch Witch press showing was Art Erlinger, left, president of Wisconsin Motor, Milwaukee. Visiting with Erlinger is Bud Hollingsworth of Ditch Witch. Wisconsin Motor's engines prevail on this line of equipment.

SPLENDOR

FOR THE GRASS

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FOR LAWN CARE

Spreads redwood composition, steer manure and ALL fibrous material. Adapts to spread granular fertilizer, pellets, plant food, lime, sand and grass seed. Large hopper loads from the top. Rollers 24", 36" and 48" wide. Control within easy reach without dismounting. Spreads evenly on level or sloping ground. Model 7010-B, push type spreader available in 24" width only. Ideal for sanding greens...roller leaves no ruts.

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SEED for SOD QUALITY

An Industry View

By Doyle W. Jacklin

Our company is primarily a producer, processor and wholesale marketer of fine turfgrass seeds. Our production centers primarily around 15 different Kentucky bluegrass varieties with our long suit being Merion, and more recently, the new variety Fylking. In addition to the bluegrasses, we produce some fine fescues and four of the new fine-textured Perennial ryegrass varieties including Norlea, NK100, Pelo and Pennsylvania's new Pennfine.

Until the end of World War II the somewhat technical turfgrass industry as we know it today was virtually non-existent. True, there were a few different kinds of grasses to market for home lawns but nothing like the myriad of varieties which we know today. We now have a wide choice of turfgrass varieties for specialized areas varying in range of disease resistance growth characteristics, and even different grades or quality categories.

Reflecting even further, until the mid-1950's, almost every lawn, whether home, industrial or institutional, was established through seeding. Then, in the 1950's, some of the more affluent members of our society asked for and received instant lawns at quite a cost premium per square yard over the traditional method of seeding lawns. This was the beginning of the instant lawn business or what we refer to today as the sod industry.

In a recent survey conducted by the Weeds Trees and Turf magazine, it was reported that the average number of years experience among U.S. sod growers was only 9.4 years per grower, indicating the youthfulness of this new industry and its probable potential for the future. Even more dramatic, however, is the 1969 record sales of $150 million posted by the industry at the grower level and the over $400 million generated at the retail or consumer level. Truly this is a dramatic and growing agricultural commodity which warrants close attention from its suppliers and, particularly, seed suppliers.

In analyzing today's sod grower, our company has concluded that:

1. He is an intelligent agriculturist and businessman familiar not only with the basic agronomic **essentials** of producing sod, but quite well versed in financial and business management techniques;
2. He is conscious of his production expenses and is continually striving to keep them low enough to provide him with a steady yet reasonable profit;
3. He is anxious and quite willing to try new products which will result in a better sod at a lower cost. These new products would include not only fertilizers, herbicides and equipment but more important to our own industry, new turfgrass varieties; and
4. Probably even more close to home, is the high quality product he produces which relates directly to the quality of the seed which he purchased to establish his fields. Seed quality therefore is important to the sod grower and even more revealing is his willingness to pay for that quality.

Although most sod producing land in the United States has historically produced other agriculture crops, there is increasing acreage of virgin land being cleared specifically for sod production. Over 50 percent of sod producing land is high in organic content and is commonly referred to as peat or muck soil. There is much conjecture as to the best soil type for producing sod but it is now generally agreed that both mineral and peat soils have their advantages and disadvantages. Varietal performance is a more important production factor than soil type.

If given proper care, sod can be lifted as early as 12 months after seeding. The average sod grower prefers to have one to two-year-old sod before harvesting to insure the development of more mature rhizomes capable of knitting properly to new soil.

New varieties are now becoming available which can produce a liftable sod within six to ten months after seeding with an even denser turf. Ironically, these same new varieties can be a problem to the homeowner if not cared for properly after sodding. With a denser sod and a higher number of leaf tillers and rhizomes and feeder roots, it stands to reason that more water will be required to keep all the plant parts turgid and living while the rooting process takes place. Sod growers, therefore, are now recommending that the new, dense varieties receive a higher frequency of watering immediately after transplanting so that they can root properly with minimum wilt and damage.

Sod growers are interested in both quality and cost when considering seed. In terms of cost per yard, it has been documented that the average to produce one yard of sod is 29 cents. This includes all direct costs, overhead, taxes, etc.—everything! Of this 29 cents, 4½ cents goes toward purchase of seed, fertilizer, and chemical spray materials. The seed cost itself accounts for only one and one-quarter cent, or 4.6 percent of the total yard production cost. Seed cost then is relatively minor compared to the other costs. When seed of a higher quality is desired, an increase or decrease in seed cost per pound does little to alter the total sod production cost.

By contrast, when seed of inferior quality produces a sod with bunchy off-types, an unattractive sprinkling of annual bluegrass seedheads, or an unsightly mat of encroaching bentgrass, then the loss per yard due to the off-grade sod price can amount to as much as a dramatic five to 10 cents per yard, or four to eight times the actual cost of the seed. Thus, growers demand the highest quality seed available. They are willing to pay the extra price necessary to the seed producer to obtain high quality seed production.

Though sod growers have been demanding high quality seed, it wasn't until two years ago that there suddenly appeared between eight and 10 different quality specifications from a like number of state and regional sod grower organizations. Each set of specifications varied widely in crop and weed re-

(Continued on page 39)

This presentation on sod quality seed from the standpoint of industry was made by Mr. Jacklin before the Biennial Conference Association of American Seed Control Officials, meeting at Portland, Ore., Sept. 12-17.

industry people on the move

CARL R. JOHNSON, to vice-president, manufacturing, for Hypro Div., Lear Siegler, from works manager. He joined Hypro in 1947.

* * *

JAMES W. CLAPP, appointed group leader, chemical research operations, R&D of American Cyanamids Ag Div., Princeton, N.J.; an employee since 1939.

* * *

CHUCK COLLINS, Scotts' Orlando golf course representative, named to introduce the company's turf management line in Florida.

* * *

ROGER A. BROWN, to vice-president, sales, turf and terra division of Koos, Inc., Kenosha, Wis., from area sales manager of International Minerals and Chemicals. Koos has announced an agreement with I.M.C. to take over a number of I.M.C. brand names and formulas.

* * *

ALLEN "BARRY" GREER, Atlanta, receives a Conwed Corporation promotion to agronomic sales specialist for the southern region. He joined the company in 1965 as a sales representative.

* * *

JAMES A. HUGHES, president of Diamond Shamrock, to chairman of board, and to continue as chief executive officer. He succeeds **RAYMOND F. EVANS,** who becomes chairman of the executive committee of the board of directors. **C. A. CASH,** named to succeed Hughes as president. Cash also named chief operating officer.

* * *

ROBERT CARSON McCONNELL, named horticultural program coordinator for Philadelphia with responsibility for 8000 acres of parkland, greenhouses, landscaping, street trees and new environmental center at Fairmount Park, from position of arborist with Fairmount Park Commission.

* * *

LESTER C. OHLE, to Thompson-Hayward as agricultural sales representative, from manager of formulation and government sales for Ciba-Geigy.

* * *

CYRIL A. KUST, promoted to group leader, plant growth regulant discovery, American Cyanamid. He joined company as plant physiologist, herbicide research early this year, from University of Wisconsin.

* * *

DAN HEDGLIN to assistant service manager for Cushman Motors, Lincoln, Neb., from district sales manager for Cushman's industrial and commercial lines at Atlanta.

* * *

R. J. (BOB) HAYES, appointed vice-president, operations, Allis-Chalmers Credit Corp. Prior to joining AC in 1962, he was with Speed Queen Co., Ripon, Wis.

* * *

CLARENCE "LES" McCOMBS, named head of department of horticulture, Virginia Tech, Blacksburg, from professor of horticulture at North Carolina State University.

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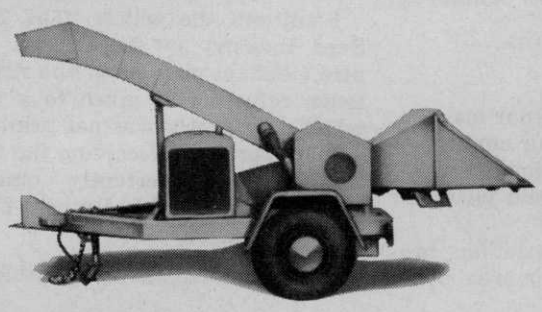

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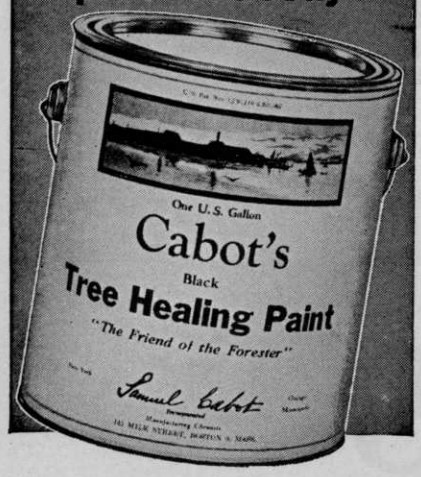
to really protect wounds and prevent decay



Cabot's Tree Healing Paint is a carefully prepared bituminous paint for protecting live wood and preventing decay. For years, leading arborists and foresters have been using Cabot's because it

- **is ideal for painting wounds, cuts, broken limbs**
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- **can be used in any season**
- **easily applied with paint brush**

A quality product from Cabot Laboratories ...manufacturing chemists since 1877

Samuel Cabot

Correction

I note in the August issue that you report the registration of amitrole as being cancelled. This is very misleading.

Only the food crop uses of this chemical have been cancelled. The non-cropland uses are still registered and will not be disturbed. Earlier this summer we took the necessary steps to change our existing labels, literature and advertising to reflect those cancellations.

Since amitrole is widely used industrially by many readers of WEEDS TREES AND TURF, I would appreciate your advising them that these uses are, and will continue to be, registered. Please note the enclosed release sent to all our amitrole customers on June 29. Note the comment by the Scientific Advisory Committee that ". . . . no evidence was presented to the committee that amitrole, as now registered, has had any harmful effects on man or animals." JOHN H. KIRCH, Marketing Manager, Industrial Chemicals, Agricultural Chemcals Division, Amchem Products, Inc., Ambler, Pa.

Editor's Note: Sorry John. I pulled this short from the EPA release for the Gov't./Business News page and should have included this notation for our readers. A. E.

Information

I am an avid reader of your magazine and have noticed your continuing efforts to debunk the overreaction by our ecologists and would-be ecologists.

I have had several invitations to speak before groups in my area and would have gladly accepted them if I had information at my fingertips that would present our side of the question. Can you tell me where I can obtain this information? JAMES R. McCURDY, President, Green Lawns, Inc., Belleville, Ill.

Editor's Note: For a beginning package of speaking materials, contact James Mills, National Agricultural Chemicals Assoc., 1155 15th St., N.W., Suite 514, Washington, D.C. 20005. The NACA has developed an excellent kit for speakers to which you can add data as it becomes available.

Deep Root Tree Injection

In your August issue there is an article regarding a new formula for deep root tree injection. Please advise where it might be purchased. We are a landscaping maintenance company and would be applying this fertilizer to plants and trees on homeowner lawns. RENE MAGUET, Pete Maguet & Sons, St. Clair Shores, Mich.

Editor's Note: We don't know if this product (Dine-A-Mo S) is for sale. But you might contact Charlie P. Johnson Spray Company, Inc., 4665 N.W. 36th Ave., Miami, Fla. 33142.

Editor Error

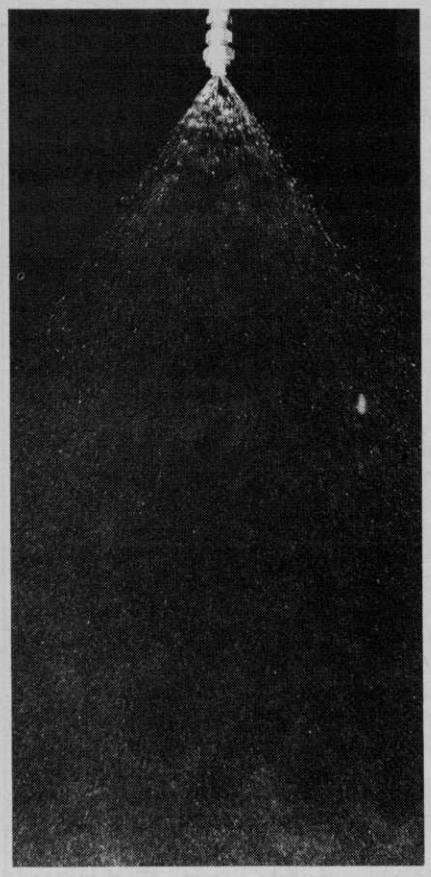
I enjoyed the article "The Grass Seed Industry — An Oregon Empire," but on page 23 of the August issue, reference is given to a table which apparently was not printed. I would appreciate receiving the table that was inadvertently omitted. ROBERT W. DUELL, Rutgers Univ., New Brunswick, N.J.

See the accompanying table.

TABLE I. Number of years a field must be free of a species to produce Foundation, Registered, or Certified seed if the previous crop was of a different variety—1971 standards

Species	Foundation seed	Registered seed	Certified seed
	years	years	years
Annual ryegrass	5	5	5
Perennial ryegrass	5	5	5
Orchardgrass	5	2	2
Kentucky bluegrass	5	3	3
Tall fescue	5	2	2
Fine fescue	5	1½	1½
Highland bentgrass	5*	5	5
Crimson clover	5	3	2
Red clover	6**	-	3***

* Deep cultivation required 2 years.
** Cultivation required 3 years.
*** Two years if cultivated 1 year.



Conventional Spray Pattern

Fomex Spray Pattern

Colloidal Reduces Drift In Herbicide Spraying

An adjuvant-nozzle system has been developed by Colloidal Products Corporation and Delavan Manufacturing Co. Petaluma, Calif. It helps aerial or ground applicators of herbicides reduce drift by as much as 70%.

FOMEX, a combined spreader-activator, as well as a foaming agent, when used in combination with a foam generating nozzle will, according to Colloidal: 1. Provide maximum contact of the spray solution with the plant surface; 2. Reduce evaporation of the spray deposit; 3. Form a fast draining foam to allow maximum liquid contact with the plant surface; 4. Increase absorption of herbicide spray; and 5. Substantially reduce spray drift.

For more information circle Reader Card No. 721.

Coming for December Annual Directory and Suppliers Guide

Seed *(from page 36)*

quirements and threatened to create a hodge-podge of specifications. As a result, seed producers in Washington and Idaho, together with the Washington State Department of Agriculture, developed what is now known as Sod Quality Certified Seed Standards. These standards were promulgated by the Washington State Department of Agriculture in 1969 and were subsequently revised and updated in May, 1971.

These Washington State standards are much more rigid than even sod grower standards. It is quite unusual that the seed industry would purposely agree to establish higher standards than required by their sod industry customers. But, in our estimation, the quality seed **can** be produced and we'd just as well produce a product which meets or supersedes all other quality specifications.

Looking at the maximum allowance weed, for instance, the average allowance by other state sod certification programs averages .10 percent, or over three times as much as the Washington State sod quality seed standards. Additionally, all certified sod quality seed must be free of coarse and objectionable grasses. In the weed section, all sod quality seed must be free of dock, chickweed, crabgrass, Black medic, velvetgrass and all prohibited noxious weeds, in addition to, and probably most important, annual bluegrass.

The sod analysis certificate is based on a 25 gram purity and includes a search for all noxious and other weeds, all crop, and a 10 gram Poa annua check and germination. Each crop or weed found is listed on the analysis and this analysis accompanies every lot of seed shipped. The sod grower will examine this comprehensive seed test-

(Continued on page 41)

3 BILLY GOAT Indoor/Outdoor Vacuums

One man with a Billy Goat becomes a big clean-up crew. Original machine BG60 is available in self-propelled (P) and push (A) models, with gasoline or propane engine, battery or electric with cord. For all models—optional intake hose for hard to reach areas.

Model	HP	Snout width	Blower housing	Application
BG60	8	30"	Steel	Industrial
BT70	8	30"	Steel	Grounds, parks
KD40	4	26"	Steel	Lawns, drives

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THE WATER ENCYCLOPEDIA, a compendium of useful information on water resources. Edited by David Keith Todd, professor of Civil Engineering, University of California, Berkeley.

Water, one of our most precious and abused resources, gets the full treatment in the new Water Encyclopedia, recently published by Water Information Center, Inc. The book marks the first time so much hard-to-find and scattered information is available in one volume.

An entire chapter is devoted to Water Quality and Pollution Control, of prime concern today, with such sub-classifications as: Drinking Water Quality Standards, Industrial Water Quality, Irrigation Water Quality, Water Quality for Aquatic Life, Recreational Water Quality, Water Treatment Processes, Waterborne Diseases, to name just a few.

Other chapters indicate its broad coverage: Climate and Precipitation, Hydrology, Surface Water, Ground Water, Water Use, Water Resources Management, Agencies and Organizations, Constants and Conversion Factors.

More than 200,000 facts qualify The Water Encyclopedia as a singular and basic reference on the subject for those in the field or just interested in it.

About the editor

David Keith Todd is a Professor of Civil Engineering at the University of California, Berkeley, where he is in charge of graduate education in water resources engineering. His education includes degrees from Purdue University, New York University, and the University of California. He is a registered professional engineer and a member of the American Society of Civil Engineers, American Geophysical Union, American Water Works Association, American Meteorological Society, and American Association for the Advancement of Science. As a National Science Foundation Fellow he has studied and conducted research on water resources in Europe. He is the author of more than 90 publications in the fields of hydrology and water resources. In recent years, he has served as a consultant to the United Nations, Federal and State agencies, several cities and other public and private organizations.

About the publisher

The Water Information Center is a small, well-established publisher specializing in basic books on the subject of water. Long before pollution became a household word, the Center was disseminating valuable information and data through its Water Newsletter, the oldest newsletter of its kind in the water field. The Center's "Water Atlas of the United States" was an award winner, receiving a certificate of special merit from the Association of Printing Industries. The Atlas was also one of a small group of publications chosen to be exhibited in the United States Pavilion at the World's Fair in New York and is still the only reference of its kind available. "The Water Encyclopedia," presented in this pamphlet, is yet another unique publication from the Water Information Center.

The 7" x 10", 550-page, hard-cover volume is available for $27.50 from Water Information Center, Inc., Dept. 3P, Water Research Building, Manhasset Isle, Port Washington, L.I., N.Y. 11050.

insect report

TURF INSECTS

WESTERN YELLOWSTRIPED ARMYWORM
(Spodoptera praefica)

OREGON: Moths (freshly emerged) appearing for first time in blacklight trap located near Macleary, Marion County.

A NOCTUID MOTH
(Agrotis ducens)

NEW HAMPSHIRE: Moths 30 in blacklight trap at Newington, Rockingham County.

A LEAFHOPPER
(Euscelis ohausi)

OREGON: Collected fourth and fifth instar nymphs on Scotch broom (Cytisus scoparius) on June 28, 1970, near Corvallis, Benton County. This is a new North American record. Distribution Europe.

TWOLINED SPITTLEBUG
(Prosapia bicincta)

SOUTH CAROLINA: Unusually heavy, spittle masses per square yard on lawns in 6 city-block-area of Myrtle Beach, Horry County.

INSECTS OF ORNAMENTALS

RED-HUMPTED CATERPILLAR
(Schizura concinnia)

VIRGINIA: Feeding on dogwood in Chesterfield County.

AN ARMORED SCALE
(Parlatoria crotonis)

FLORIDA: Taken on croton at nursery in Chattahoochee, Gadsen County, May 7, 1971. This is a new county record.

TREE INSECTS

EASTERN SPRUCE GALL APHID
(Adelges abietis)

WEST VIRGINIA: Infestation fifty percent on 12 acre block of Norway spruce in Wetzel County, August 12.

ELM LEAF BEETLE
(Pyrrhalta luteola)

NEVADA: Damage heavy to trees in Caliente, Lincoln County. Damage heavy in Fallon, Churchill County. Damage light to medium at Topaz Lake, Douglas County. KENTUCKY: Completely defoliated elm trees in Knott and parts of Jackson Counties.

LARCH CASEBEARER
(Coleophora laricella)

OREGON: Very rapid and unexpected southward movement in Umatilla County larch. Originally detected at Tollgate, June 1970, this species spread into Emigrant Park area between Pendleton and La Grande and into Battle Mountain State Park, located 35 miles south of Pendleton.

DOUGLAS FIR TUSSOCK MOTH
(Hemerocampa pseudotsugata)

CALIFORNIA: New infestation in estimated 3000 acre stand of mixed forest and private property in El Dorado National Forest, El Dorado County. Mixed populations from light to heavy at Nevada Point, Georgetown area, and along Rubicon River eastward.

classifieds

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

Rates: "Position Wanted" 10¢ per word, minimum $3.00. All other classifications 20¢ per word, minimum $4.00. All classified ads must be received by Publisher the 10th of the month preceding publication date and be accompanied by cash or money order covering full payment. Boldface rule box: $25.00 per column inch.

HELP WANTED

WANTED: GREENS SUPERINTENDENT. Seeking a man with the following qualifications: academic background in turf strongly preferred; 28 to 40 years old; experience with new courses desired, but not necessary; willing to relocate and look at new ideas; excellent salary with a tremendous future potential. Write Box 70, Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

USED EQUIPMENT

RECONDITIONED brush chippers, sprayers, log splitters, stump routers, bucket trucks. Let us know your needs. Equipment Sales Company, 5620 Old Sunrise Highway, Massapequa, New York 11758. Phone 516 799-7619.

1968 ASPLUNDH 16" 8 cylinder Chipper, $3400.00; 1968 5T Alenco Crane with 60' boon extension on Ford Chassis, $10,500.00. Ohio Chipper & Equipment Co., Mentor, Ohio 44060. Phone 216 255-4355.

SEEDS

SOD QUALITY MERION SEED for discriminating growers. Also Fylking, Delta, Park, Newport, Nugget and Pennstar bluegrasses as well as fine fescues. We will custom mix to your specifications. Michigan State Seed Company, Grand Ledge, Michigan 48837.

FOR SALE

DOUBLE EDGE sod cutter blades. Will fit any Ryan sod cutter. Works like double edge razor blade. Cuts much more sod per blade. Made to bolt on both ways. $24.00 plus postage. New automatic sod loaders for direct loading to pallets, trucks or trailers. No workers needed on ground. Both products developed and designed by Hadfield. Write or call Glen Hadfield, 4643 Sherwood, Oxford, Michigan 48051. Phone 313 628-2000.

SPRAY AND TREE SERVICE—Illness forces sale of fast growing but stable business. Regular four time per year customer route. Very modern equipment. $34,500.00, terms. Write: George DesBrisay, 333 American Bank Bldg., Portland, Oregon 97201.

Seed *(from page 39)*

ing certificate before buying a particular lot for his use. The seed lots which meet the Washington State certified sod quality requirements will be eligible to carry the special gold, sod quality seed tag. The gold, sod quality tag carries simple, specific language including the lab test number of the official sample test of the lot.

Probably the two most important developments from the new sod quality, certified seed program have been:

1. The standardization of all specifications into one workable and acceptable program which meets the desires of both seed producers and sod growers; and
2. The actual establishment of a new program within the certification scheme which defines and sets premium quality seed specifications.

The program isn't just a name but is synonymous with high quality seed. More important, sod growers are not the only group of buyers interested in this type of seed. Golf course, park maintenance and cemetery superintendents are all interested in premium lawn seed and a considerable amount of gold tag, sod quality seed is being used in this trade.

Based on our own production and experience during the last two years since the sod quality certified program has been in existence, I predict that within the next one to two years over 80 percent of seed sold to sod growers must meet specifications such as are contained in the Washington State sod quality certified seed program. Sod growers want and will pay for quality if quality seed can be produced. The future of sod production and, indirectly, sod quality seed, indicate: 1. The sod business is increasing in two ways, first, original growers are producing and selling more acres of sod, and secondly, new growers are entering the business; 2. More and larger farms are in evidence and growers are turning more and more to mechanical, labor-saving equipment. They will, as a group, be doing more public relations and advertising which in part has been a direct result of new varieties and blends being produced which can be promoted according to their various attributes in competition with other sod growers' varieties; 3. The sod grower will continue to develop into one of the finest agricultural business men in existence today and, as a result, he will be more conscious of his income, expenditures, profits, etc.; and 4. Because of his increased awareness in the income and expenditures section he will be more aware of high quality seed which will be used to produce his product and the results obtained from using such high quality seed in comparison to a low quality seed which will usually result in a higher total cost at lower net profits.

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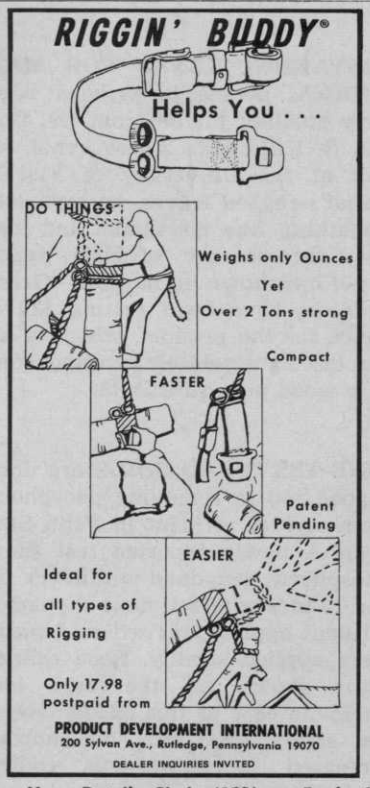

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Trimmings

A SMOKE-FREE MOBILE BURNER and field sanitizer is now being tested in Oregon as a possible substitute for open field burning in grass seed production. Dr. D. O. Chilcote of Oregon's state university reports some removal and utilization of straw may also be possible, as paper, animal feed, wallboard, or fuel. A state law bans such burning beginning Jan. 1, '75.

* * *

GOLF COURSES HAVE BECOME NO. 3 in the pecking order in environmental relationships. Golf course architect Desmond Muirhead says people like to live on the seashore. The No. 2 spot is a lake, then a golf course. Thus, corporate land developers, where possible, try to develop property where new residents can overlook a lake to a golf course.

* * *

THE 10 MOST POPULAR SHADE TREES — as determined at a recent National Landscape Association meeting—are (in order of importance): pin oak, red maple, honey locust, sugar maple, red and scarlet oak, linden, ash, Norway maple, sweet gum, and birch. Choice was based on designer and landscaper demand, disease resistance, and success in transplanting.

* * *

MISTAKING KENAF FOR MARIJUANA, people have been regularly stealing plants from Dr. Gordon B. Killinger's 2-acre kenaf test plot at the University of Florida. Kenaf's ragged leaves, he says, look something like marijuana and local law enforcement officials report kenaf has shown up in raids. "Grass" peddlers have been getting $20 an ounce for the product, which is under test as a possible livestock feed or a wood pulp substitute.

* * *

FINE-TEXTURED SOILS are doing a good job in removing phosphorus from sewage effluent in Penn State tests. A newly reported test shows phosphorus remained within the upper 12 inches of soil after 6 years of effluent applications where 2 inches were applied weekly. Reed canarygrass grown on the area took up 25- to 63% of this excess. Morrison sandy loam soil, by contrast, increased in phosphorus content as deep as 3 feet.

National Irrigation Show Begins Feb. 29 at Denver

A national exposition of irrigation equipment — Irri-Tech '72 — is being held Feb. 29-Mar. 2, at Denver, Colo., at Currigan Exhibition Hall. The Hall is a part of the new Denver Convention Complex and will accommodate the big irrigation equipment.

Exposition Manager Bernie Manuel says the event amounts to bringing an outside irrigation show inside, where more than 50,000 square feet of clear-span space is available. The exposition, he says will include both agricultural and turf irrigation equipment, pipe, pump hoists, turbine pumps, drilling rigs, turf equipment and other supplies.

Show sponsorship is by Water Well Associates and Irrigation Journal. Official opening is an exhibit preview and party on the exhibit floor at 6:00 p.m. Feb. 29. This immediately follows the close of the annual Technical Conference of the Sprinkler Irrigation Association which is headquartering at the Brown Palace in Denver. Main exhibit days are March 1-2.

Irri-Tech '72, according to Manuel, is an irrigation trade show, primarily for distributors and contractors. But with the exhibition of all types of equipment and supplies, a special effort is being made to invite all persons interested in both agricultural and turf irrigation, including consulting engineers, golf course superintendents, commercial turfgrass managers of all phases of the industry, plus dealers, distributors and others.

Details of the show may be obtained from Manuel at 610 South Cook St., Barrington, Ill. 60010; telephone (312) 833-6540.

Thompson-Hayward Releases Research Report Brochure

A color illustrated research report on aquatic weed control is available from Thompson-Hayward. It shows results of Casoron for control of alligatorweed, fragrant water lily and spatterdock in the Southeastern U.S.

All uses shown in the report do not appear on the present Casoron AQ label, but the company believes the information accurate and that it will appear on the next revision of the label.

The brochure also includes detailed line drawings of nine common aquatic weeds. (For a copy of the brochure, circle Reader No. 720 on the reply card).

Slow Release Via Rubber In Pesticide Research

A new way to use pesticides by dissolving them in rubber for slow and controlled release is being researched.

At the American Chemical So-

On Protecting Your Business

The state of Virginia's department of Agriculture and Commerce gave a recent assist to the legitimate commercial turf industry recently when it warned homeowners to deal only with known, reputable operators.

The department in a Consumer News release pointed up the big increase in the tree, shrub, and lawn care businesses within the past sevseveral years. Some of these professional companies, the department reported, are offering a complete line of services such as trimming, pruning, treating for insects and diseases, installing so-called proper cabling for trees, and the feeding of lawns, trees and shrubs.

Some, according to the state, are long-established, reputable, and have the expertise to do the job properly. Others—according to the warning—are only mediocre and often do not do the job as they should for the home owner.

Before doing business, the state suggests that the homeowner have some personal knowledge of the operation or that he contact the Better Business Bureau to check on reputation, honesty, and ability. The department also suggested that it be contacted to see if Virginia's fertilizer and pesticide laws are being complied with.

The report indicates one problem area includes rate of dilution of fertilizer applications where the homeowner may be paying for 99% water.

ciety's annual meeting, held last month at Washington, D.C., data on the new method were presented.

A nonpersistent pesticide or herbicide dissolved in natural or synthetic rubber is released slowly to maintain a very low level of the chemical in the environment. The overall amount of a chemical needed will probably never exceed 3% of that conventionally used, and may be 0.1% or less, explained N. F. Cardarelli, associate professor at the University of Akron and chief scientist at the Creative Biology Laboratory, Barberton, Ohio.

"Conventional pest control techniques rely mainly upon the application of a chemical agent to the infested habitat," said Professor Cardarelli in an interview. "Since the dose-time relationship is critical and most pesticides deteriorate rapidly and are lost through natural processes, very large dosages are necessary. The target animal or plant succumbs to chronic intoxication. Economics dictate the use of massive dosing of short duration followed by periodic retreatments.

"However, most organisms will succumb to a much lower dose of the same agent applied continuously through chronic intoxication. This fact is well recognized as a source of concern where persistent pesticides, such as DDT, last for months or years affecting both target and nontarget life.

"Nonpersistent control agents can be effectively used as chronic toxicants through the slow release mechanism. A very low concentration of a specific pesticide can be continuously maintained in the aquatic environment, eliminating the pest in question through chronic effects. The overall amount of a chemical needed will probably never exceed 3% of that conventionally used, and may be 0.1% or less.

"The slow release mechanism is based upon the fact that certain biocides are soluble in elastomers such as natural rubber, chloroprene, styrene-butadiene polymers and a few others. Solution equilibrium results and dissolution of the toxicant molecules on the surface results in the migration of internal molecules to the depleting surface. A continuous release is thus established. Loss rate can be adjusted through proper formulation.

"The principle was first exploited in antifouling rubber, now a commercial product, early test specimens showing 100% biological control over 84 months. The concept has been extended to aquatic snail control and more recently, water weed control.

"Snail vectors of the trematode parasite causing Schistosomiasis, a tropical malady affecting upwards of 300 million people and second only in economic importance to Malaria, have been effectively destroyed by slow release molluscicides. Minute concentrations of various agents are lethal within minutes to the aquatic form of the parasite, and at levels sub-lethal to the host snail.

"More recently, slow release herbicides have been formulated and found effective against specific water weeds. Elastomers, by their nature, lend themselves to shapes and forms conducive to the release of the herbicide in the phytozone of interest, thus still further reducing environmental contamination by concentrating the agent in that portion of the water course inhabited by the pest.

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